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DISEASES OF THE BREAST

A CLINICAL TREATISE

ON

DISEASES OF THE BREAST

BY

A. MARMADUKE SHEILD, M.B. (CANTAB.), F.R.C.S.

SENIOR ASSISTANT SURGEON AND LECTURER ON PRACTICAL SURGERY TO ST. GEORGE'S HOSPITAL;
LATE ASSISTANT SURGEON, AURAL SURGEON, AND LECTURER ON OPERATIVE SURGERY
TO CHARING CROSS HOSPITAL; ASSISTANT SURGEON TO THE HOSPITAL FOR
WOMEN AND CHILDREN, WATERLOO BRIDGE ROAD

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London
MACMILLAN AND CO., LIMITED
NEW YORK: THE MACMILLAN COMPANY
1898

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PREFACE

I HAVE often been struck with the difficulties in diagnosis and treatment of maladies of the breast, experienced even by surgeons of acknowledged eminence and repute. I have from time to time collected notes of many cases of interest in mammary disease from the practice of the Cambridge Hospital, and from the various other public institutions with which I have been connected. A careful study has been made of the Registrar's notes at St. George's Hospital between 1865 and 1895, a period of thirty years. In like manner, I have availed myself of published reports of the various London Hospitals, and I have studied the specimens of mammary disease in all the London Museums, and at the Royal College of Surgeons. I have also bestowed a more cursory examination upon the specimens in the Leeds and Edinburgh Museums. From these materials and my own experience the present book is compiled.

An immediate difficulty presented itself, in the attempt to do adequate justice to the opinions and researches of the many writers in this branch of surgery and pathology. This is especially the case in the subject of mammary tumours. So varied is the literature, and diverse the nomenclature, that a book might well be written upon this subject alone. Bearing in mind that a work of this kind, if it is to be read by those whose time is much occupied, must be kept within convenient limits, the contents are largely drawn from my own experience and the practice of the Hospitals with which I have been connected. At the same time, I have set myself the difficult task of quoting the important work of others to the utmost, so that the book may contain as much information as possible of a sound practical nature, without being unduly condensed in style, or rendered bulky and wearisome by statistical details.

Several volumes would be needed for a complete treatise on mammary diseases, but it is hoped there is little or nothing omitted from the present book which is of real practical importance.

The illustrative cases which have been introduced, especially in the chapters on Abscess and Carcinoma, are numerous. A certain tendency to repetition may be observed in them. This is inevitable, for Carcinoma simulates so many mammary affections, that the importance of the subject must serve as an excuse for the constant mention of it, in the various chapters devoted to other subjects.

The pathological part of the work is of necessity brief, and only those points have been touched upon which serve to illustrate the clinical material dealt with. It is hoped, however, that no subject of both clinical and pathological importance has been left unnoticed.

The illustrations are almost entirely original, and have been executed by various artists. The microscopical sections have been faithfully copied from actual specimens by Mrs. Danielson, the coloured plates by Miss Mabel Green, and the pathological specimens by my friend Dr. Goldsmith and other artists. Great difficulty has been experienced in choosing the subjects for illustration, on account of the multiplicity of conditions which need actual depicting. The microscopical characters of mammary tumours, in all their diverse aspects, would alone necessitate an elaborate and costly atlas. I have therefore endeavoured to select those subjects for illustration, which are of especial clinical and pathological importance, and serve to further make clear the adjacent text descriptions.

I could not conclude this preface without acknowledging the assistance I have received from others. To my colleague Dr. Rolleston I owe a debt of gratitude for preparing most of the microscopical sections, as well as for reading some of the proof-sheets. My surgical colleagues have generously allowed me to see many of their cases, and to inspect and examine the morbid specimens removed in their operations. All information received from these and Museum sources, has received due acknowledgment in the text.

It is hoped that this book will, for its limited size, contain useful and practical information in a condensed form, which may be of real interest and utility to the busy practitioner and advanced student.

4 Cavendish Place,
Cavendish Square, W.

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CHAPTER I

A SHORT SKETCH OF THE DEVELOPMENT, ANATOMY, AND FUNCTIONS OF THE BREAST, WITH AN ACCOUNT OF THE PRINCIPAL ABNORMALITIES

Development and growth of mamma and nipple—Precocity of development—Imperfect development—Situation and naked-eye anatomy: vessels, nerves, lymphatics—Minute structure: the milk—Polymazia and accessory nipples: gynæcomazia, hypertrophy, amazia, micromazia.

Development of Mammæ.—The first trace of the mammary gland in the fœtus is seen about the fifth or sixth week, as a somewhat circular thickening of the epidermis and rete mucosum. About the third month, the proliferating cells of the rete cause a slight circular depression, termed the glandular area. At the sixth or seventh month, a number of cellular offshoots are to be seen budding inwards and invaginating the superficial cells round them. These cellular masses are columnar in shape, but fatty degeneration of the central cells rapidly occurs at birth. Simple tubular ducts branched at their extremities are formed, and the milky fluid expressed from the breast of a newly-born infant is largely the result of degeneration of the central developmental cells of the primary columnar masses. Up to the age of puberty the structure of the male and female mamma is practically identical. About the advent of puberty in the female, a rapid development of the acini occurs by the formation of saccular and flask-like processes, which bud in clusters from the walls of the ducts. During the stimulus of early pregnancy, this formation of fresh acini in the mamma is extraordinarily rapid and very extensive.

The opinion that the mamma is formed by budding ingrowths of the epiblast, similar to the observed formation of the sebaceous glands, obtains general support, and this view is shared by such eminent authorities as Kölliker, Waldeyer, and Remak. Creighton, on the contrary, in his work on the development of the breast, argues ably in favour of a view, which also previously obtained the support of Goodsir, that the breast is formed in mesoblastic tissue, and that the ducts extend outwards. Creighton points out striking resemblances to the development of the mamma in certain masses of subcutaneous inguinal fat, found in kittens and guinea-pigs. In the early human embryo the ducts undoubtedly open flush with the surface, the nipple being afterwards formed by cellular accumulation, and the development of unstriped muscle, while the ducts open on its summit. The human nipple is therefore a true teat, and must be clearly distinguished from a false teat, as exemplified in the cow; here the integument rises round a sacculus, into which the ducts open. The nipple with its rudimentary gland structure is called the mammilla. It is circular, deep red in colour, and until the catamenial period seldom larger than a sixpence in diameter. An elaborate paper was read by Dr. Reins of St. Petersburg in the anatomical section of the meeting of the International Congress,[1] in which he strongly supports the view that the mamma is developed from epiblast. Finally, Bowlby[2] criticises Creighton's views, and follows Kölliker in concluding that the mamma is developed from epiblast, the ducts being formed by ingrowths from the rete mucosum, and the acini by pouching and cellular development in the walls of the ducts. The mesoblast has no share in the development of the mamma. Space will forbid a further consideration of this controversial matter. The reader may agree with the majority, and regard the mamma as a highly formed and specialised sebaceous gland, developed like those structures from the epidermal layer.

Rate and Progress of Growth.—Under ordinary circumstances the mammary gland remains quiescent until the age of puberty, when uneasy sensations occur in the breasts, which notably enlarge concomitantly with the establishment of the menstrual flow. Enlargement, with uneasy sensations, is also not uncommon in the male at this period. The increase of size is due not only to extension of glandular structures in a peripheral direction, but also to the formation of a cushion of fat beneath the skin, which gives to the virgin breast its rotundity and smoothness. In pregnancy and during lactation the breasts increase enormously in size, new gland tissue being formed in all directions, and in delicate skins, blue veins can plainly be seen which before were invisible, marking the great increase in vascularity of the parts. At the same time the areola round the nipple loses its pink colour and becomes dark and pigmented, the small accessory glands then formed (tubercles of Montgomery) projecting upon the surface. During lactation, especially early lactation, the lymphatic glands become considerably enlarged. This is due to increased vascularity, and the stuffing of the gland, with cellular products, some of which resemble colostrum cells. This physiological enlargement of the glands, must be taken into careful account in the diagnosis and apparent increase of morbid growths during lactation. After lactation the breasts become flaccid and pendulous, and their smoothness and plumpness are superseded by a granular and lobulated condition, the disappearance of the fat allowing the mammary tissue to be plainly obvious (Fig. C, Plate I.). In old age the gland shrinks and atrophies to a marked degree, being represented by wrinkled flaccid folds of integument, with a wart-like pigmented nipple in the centre. No trace of glandular structure remains, beyond a few atrophic cells embedded in dense fibrous tissue (Fig. D, Plate I.). In exceptional instances the enlargement of the mamma in pregnancy becomes so great as to cause alarm, and constitutes a veritable disease. After lactation, however, such conditions usually again subside, and the surgeon must not hastily advise operative measures.

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[1] *Brit. Med. Journ.* 1881, ii. p. 298.

[2] *Ibid.* 1882, ii. p. 1143.

Warren[1] relates the case of a young woman aged twenty-two, whose breasts, always large, underwent rapid growth during pregnancy. The left breast measured 27 inches in circumference, the right 26 inches.

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[1] *Boston Med. and Surg. Journ.* 3rd August 1893.

The patient suffered no pain or inconvenience. After confinement the glands diminished in size. Both axillæ were occupied by soft, almost fluctuating swellings (accessory mammæ ?).

Anthony[1] publishes the sequel to Warren's case. He states that the patient became pregnant for the third time, and was under his observation during her pregnancy. The breasts, which had become smaller after her second delivery, again increased, till they grew very large and pendulous. A rudimentary nipple formed in the right axilla. An accessory nipple on the under surface of the left breast was surrounded by a dark areola. Labour was normal. The patient insisted on suckling the child, which she had not done after the second labour. The supply of milk was equal to the demand. Two months after delivery the breasts were once more as small as before the pregnancy. .

In the male, the breast remains permanently of the infantile type. It occasionally happens that slight enlargement of the breasts occurs in newly-born infants, and a milky secretion may flow in some quantity from the nipple ducts. This enlargement is often injudiciously encouraged by the attentions of ignorant nurses who rub the parts, and thus abscess has even been produced. The period of puberty is an uncertain one, and in hot climates, and under certain enervating conditions, the menstrual flow and sexual activity come on comparatively early. There are many cases recorded in this country of full sexual development at the age of eleven or twelve, and extraordinary instances of development of the mammæ and sexual organs are not wanting at an extremely early period. Birkett[2] refers to a case where the mammæ were developed at three years of age, with pubic hair and a regular catamenial flow, and Embling describes menstruation in a little girl of three years old.[3] "The mammæ were as healthily developed as in an adult of twenty years."

In the year 1811, the Regius Professor of Clinical Medicine at Oxford addressed a letter to Matthew Baillie on a case of precocious puberty in a girl. The learned professor considered the subject of sufficient importance to be couched in Latin. He thus alludes to the enlargement of the breasts at the middle of the second year. "Circa mediam partem anni secundi ab istium natali, mammæ sorori coepissent, et crescentes indies, ad mediorem magnitudinem, ut in virgine adulta, pervenissent."[4]

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[1] *Boston Med. and Surg. Journ.* 22nd August 1895.

[2] *Diseases of the Breast*, p. 19.

[3] *Lancet*, 1848, i. p. 137.

[4] *Medico-Chirurg. Trans.* vol. ii.

A remarkable case of early development of the mammary glands is recorded by Dodd of Rillington.[1] A female infant commenced to menstruate when twelve months old, and the child became pregnant at the age of nine. Her breasts then became like those of an adult, and they were engorged with milk. The child's infant, however, did not long survive. It weighed 7 lb., and was remarkable in having only three toes on the left foot.

Flaccidity and flatness of the mammæ are found in a variety of morbid conditions. Some women have naturally fine busts, and the reverse is often the case in those who are tall and thin, who menstruate feebly, and have dormant sexual desires. In wasting illness, as phthisis, mammary atrophy is common. The sympathy and correlation between the pelvic sexual organs and the mammæ are well known. The breasts are small and flat in cases of stunted and imperfect development of the uterus and ovaries. This seems directly the reverse of what occurs in the male, where feeble sexual powers and atrophied testes are often associated with the formation of much mammary fat. Mental conditions, as disappointed love, will often cause marked mammary atrophy, while rapid development of the mammæ is a commonly noticed symptom in the newly married.

There is thus seen to be the greatest variety in the condition of the breasts in different individuals. The nipple shares in the variations of the mammæ. Up to the age of puberty it is flattened and atrophic, but in the fully-developed virgin it is of a rosy-pink colour, projecting forwards, upwards, and outwards. From the pressure of "stays," or from congenital causes, the nipples are frequently retracted and badly developed. They may also be bifid, or very deeply lobulated. After lactation the nipple is more pendulous and teat-like, and in old age it is flaccid and deeply pigmented. Mal-development of the nipples is an exceedingly common condition, and a fruitful source of "infective" abscesses and certain morbid growths. The pressure of "corsets and stays" has undoubtedly much to do with this imperfection. According to Leichtenstern, when the human embryo is seven and a half centimetres in length, a single furrow appears in the superficial layer of the skin. The milk-ducts when first observed in the embryo are ten centimetres long, appearing later in communication with the preformed papillæ, which have gradually been elevated out of the original furrow in the skin. If the development is arrested, so that the embryonic skin-furrow does not rise into a complete papillæ, then in the adult the nipple retains its original embryonic form, being stunted, and retracted, and giving rise to much trouble and difficulty in lactation.

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[1] *Lancet*, 9th April 1881.

In many women an extraordinary development of subcutaneous fat occurs at the menopause. In such, the breasts instead of shrivelling increase to an enormous size, and are full of lobes and lobules of oily yellow fat, which also is found in the submammary region and axillary lymphatic glands. The true breast tissue is nevertheless wanting, the glandular material being withered and atrophic.

SURGICAL ANATOMY OF BREAST

Situation and Naked-Eye Anatomy.—The breast when fully formed is an irregularly hemispherical gland extending vertically from the third to the sixth or seventh rib, and transversely from the border of the sternum to the anterior border of the axilla. It is especially important to note that the outlines of the gland tissue are not rigidly defined, for string-like processes or cusps extend to various distances in different directions. Thus two or more prolongations of breast tissue may pass towards the edge of the sternum, and others to the axilla, "tailing off" as stringy processes which are often taken for lymphatics. In a girl who died during parturition I found one of these cusps passing actually across the axillary sheath. In the submammary region, offshoots of gland tissue pass through the pectoral fascia.[1] In puberty the mammary tissue reaches down to the eighth or ninth rib. In amputation of the breast for cancer, gland tissue may easily be left behind in one of these situations, and thus local recurrence of cancerous disease is sometimes to be explained.

The nipple is placed below and internal to the centre of the organ, and in the virgin usually points forwards and upwards. It is surrounded by an area of delicate skin termed the areola, and from fifteen to twenty accessory sebaceous glands are here situated, their ducts running towards the nipple. These form obvious prominences in pregnancy and lactation (tubercles of Montgomery).

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[1] We owe to Heidenhain our knowledge of the submammary extensions through the pectoral fascia.

In substance the breast consists of a dense network of areolar and connective tissue containing in its meshes much yellow fat. The secreting structure is represented by ten to twenty compressed racemose glands, each cluster being of pyramidal outline, with the ducts converging towards the nipple. The gland is situate between the two layers of the superficial fascia, which splits to receive it, and posteriorly it lies upon the pectoral fascia, being loosely attached to the latter structure by processes of connective tissue containing in its interstices much fat, and large lymphoid spaces (submammary bursa of Velpeau). Here cancerous infiltration only too readily occurs. The anterior layer of fascia is intimately connected with the skin, and numerous fibrous processes pass

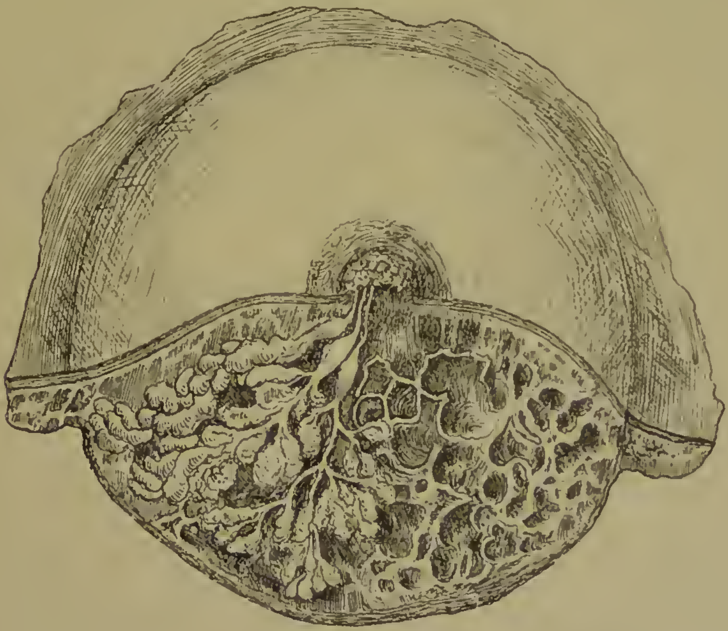

Fig. 1.—A partially dissected mamma. After Luschka.

from the integument to the areolar network of the breast (ligamenta suspensoria). Thus when the breast substance is contracted or puckered by a hard cancer or chronic inflammation, dimpling of the skin is produced over the seat of mischief from traction upon the ligamenta suspensoria.

The male mamma measures, as a rule, about an inch in diameter, and is placed in the fourth interspace a little internal to the border of the pectoralis major. The nipple is small, and the pale areola is often covered with black hairs. The male nipple is by no means constant in position, but is usually found in the interval between the fourth and fifth ribs an inch outside the cartilages. The male mamma, in minute structure, usually maintains the infantile type.

Blood-Supply.—The arteries of the breast are derived from the perforating branches of the internal mammary through the second, third, and fourth intercostal spaces; also from the perforating branches of the aortic intercostals and thoracic twigs of the axillary. One of the latter may be of large size, especially in the pregnant female, and, taking the place of the long thoracic, receives the name of external mammary. The veins terminate in the veins corresponding to the vessels above named. They anastomose very freely, forming a circle around the areola (circulus venosus of Haller). A number of the superficial veins cross the clavicle to the root of the neck. In removing the breast, the main sources of smart bleeding will be towards the axilla. The perforating vessels, if cut very close to the internal intercostal muscle at the edge of the sternum, may retract beneath it, and are difficult to secure. In thin women, therefore, the thorax may be opened by incautiously following the source of bleeding close to the sternum.

Nerves.—The skin over the mamma receives sensation from the lateral and anterior cutaneous branches of the second, third, fourth, and fifth intercostals. The connection of the lateral cutaneous twig of the second intercostal, with the lesser internal cutaneous or nerve of Wrisberg, explains the pain down the arm, often so troublesome in mammary cancer. In addition to this, the skin over the breast above, is supplied by supraclavicular descending branches of the cervical plexus, principally from the third cervical nerve. These extensive nerve communications explain the widespread pains of mammary growths. The surgeon will remember that severe "neuralgic" pains about the pectoral region and breast may not be dependent upon abnormal conditions of the mamma itself, but upon irritations of the nerve trunks or roots, especially by caries of the spine, thoracic growths, or malignant disease of the gullet or stomach.

Lymphatics of Mammæ.—The lymphatic system of the breast is exceedingly complicated, and has much engaged the attention and led to diversity of opinion among anatomists. The subject has been exhaustively treated by Stiles in an elaborate paper.[1] Surgically speaking, however, the matter may be thus summarised.

The lymphatics of the breast are very numerous, and are largely employed in removing the waste products of cell degeneration. There is a remarkably free communication between the lymphatics of the breast and the axillary glands. This is more marked during vascular and cellular activity of the breast, and will account for the fact that glandular implication is rapid and extensive in the quickly-forming cancerous tumours of women during sexual life, tardy or absent in hard atrophic tumours growing in the functionless mammæ of the aged. The lymphatics commence as a dense network around the lobules receiving the lymph from the intra-acinous spaces. A number of these run towards the areola, where they form a circumferential plexus, often markedly and visibly affected in rapidly growing cancers. Other lymphatics of the parenchyma pass with the main blood-vessels. The lymphatics of the skin of the mamma communicate very freely across the middle line with those of the other breast. This may account for deposits of cancer in both breasts, which does not therefore of necessity mark profound constitutional affection. Some of the lymphatics of the skin of the mamma also pass to the glands at the root of the neck. With these exceptions, the lymphatic trunks of the mamma are directed in two directions. Undoubtedly the main bulk pass to the axilla. I have known the axillary glands affected in cancers quite at the sternal margin of the mamma. A certain number of the lymphatic channels of the inner quadrant of the mamma accompany the perforating vessels to the lymphatic ganglia of the anterior mediastinum. The main bulk of the lymphatic channels, however, perforate the submammary pectoral fascia and join the axillary glands. The communication between these glands and the submammary lymph spaces is very free, and affords a strong argument for the removal of the axillary lymphatic tissue in operations for cancer. Three more practical points may here be adduced. The free distribution of lymphatics in the skin, and their communication with the lymphatics of the parenchyma, necessitate a very free removal of integument over a cancerous tumour. The pectoral fascia may surgically be considered as a sponge-like lymphatic highway, and every scrap of this structure should be most carefully removed. The glands at the root of the neck, or just below the clavicle, may, in exceptional instances, be affected apart from the intervening chain in the axilla. The axillary lymphatic glands are practically directly continuous with the axillary cusp of mammary gland tissue. Stiles, in his important paper, also calls attention to the fact that the axillary glands in obese women frequently undergo fatty degeneration, being converted into yellow lumps, readily mistaken for fat only. By microscopical examination he claims to have established the fact that the "stringy cords," so often detected reaching up into the axilla in cases of cancer, are not indurated lymphatics, but really mammary tissue and ducts. It is well for the surgeon to clearly understand that the lymphatic distribution in the skin of the breast, and beneath it, and the communications with the axillary lymphatic tissues, are remarkably free and widely spread. It is well not to be too strongly influenced by anatomical researches, and the practical fact remains that the axillary glands may be, and commonly are, implicated in carcinoma of any part of the mamma. The communication between the perforating lymphatics and the mediastinal glands and lymphatics of the pleura is very important, and from analogy there is reason to fear that these structures may be implicated in cases of cancer of the breast far earlier than is generally known or believed. Recurrence of the disease, and

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[1] *Trans. Edin. Med.-Chir. Soc.* vol. xi. pp. 37-70.

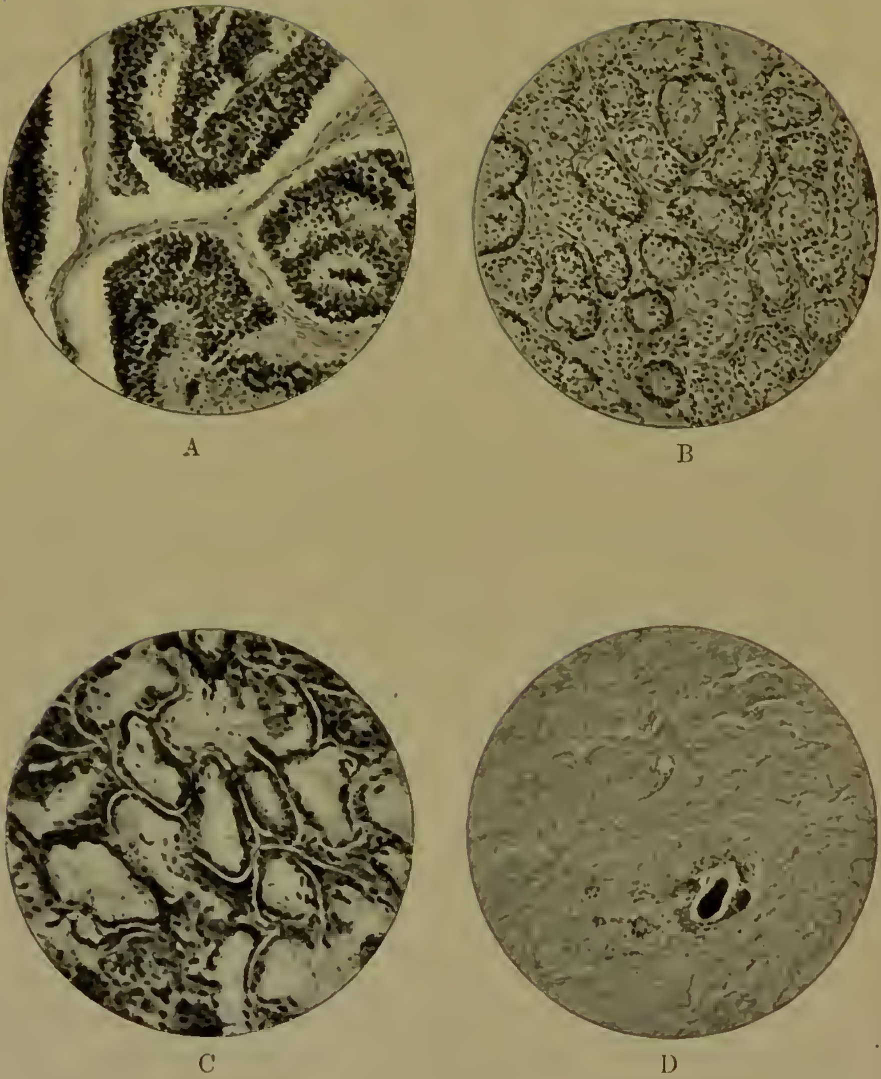

PLATE I.

A, The structure of the normal mamma in a girl aged eighteen. B, The structure of the mamma on the advent of parturition. The alveoli are full of cells and colostrum corpuscles. C, The structure of the mamma after prolonged lactation. The alveoli are drained and empty. D, The structure of the mamma in a woman of seventy-five years of age. The gland consists of fibrous and connective tissue. One shrivelled duct and remains of atrophied glandular cells are seen in the specimen.

To face page 11.

manifestations of it, in the shape of button-like nodules on the pleura, are too familiar to pathologists.

Minute Structure of Mamma.—A lobule of mammary gland may be looked upon as typical of a compound racemose gland. The acini are lined with polyhedral or short columnar cells, and from spaces between these the lobular ducts issue and unite to form lobar ducts, which are from fifteen to twenty in number and open in small depressions near the summit of the nipple. The smaller ducts are merely composed of basement membrane and flattened epithelium, but as the ducts get larger, areolar tissue and unstriped muscle enter into their composition, the latter being arranged in a circular manner. The cells are also more prominent and of a columnar shape. Close to the summit of the nipple they again become flattened and approximate to the flattened endothelial type. The ducts near the base of the nipple are distinctly ampullated, and bent considerably out of the straight course. When the nipple is prominent and erectile, the ducts are straightened. The ultimate acini of the breast are separated from each other, as are the lobes and lobules of glandular substance, by interposed fibrous and connective tissue, sparsely nucleated, and it is peculiarly worthy of remark that in the normal state no cells of the epithelial type penetrate this tissue. There is probably no glandular epithelium that varies more in nature and activity than that of the acinous pouches of the breast. At the advent of lactation the cells are plump and granular, multinucleated and cylindrical in form, the tiny droplets of oil being visible within them. Every stage is seen from the early granular cell to the protoplasmic mass bursting and discharging its products into the central lumen (Fig. B, Plate I.). According to Heidenhain, in the non-secreting gland the cells are flattened and contain one nucleus. At the time of lactation cellular masses bud off from the walls of the acini, and the central cells of these become fatty and disintegrated, forming a central lumen, and also constituting milk.[1] Some of the closely superimposed acini become connected by absorption. In the unimpregnated breast the epithelium is flattened, and the acini may be filled with granular débris. In the atrophic breast of the aged the epithelium is withered and degenerated, the interlobular fibrous tissue increased, and the acini filled with amorphous material. The functions and activity of change of the mammary epithelium being so peculiar, it is not surprising that morbid growth is readily excited in it. Masses of fat are interspersed between the breast tissue.

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[1] As the milk contains volatile substances and salts, it can hardly be entirely formed by cellular disintegration, but rather, after the manner of sweat, from the flattened cells on the walls of the acini.

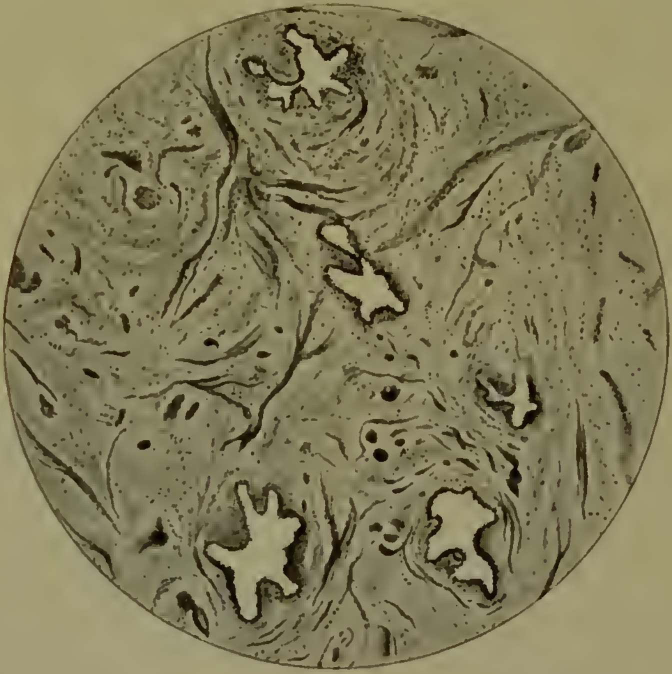

FIG. 2.—Transverse section of the base of the nipple under a low power, to show the large amount of unstriped muscle and the plicated ducts.

Structure of Nipple.—The following description applies to the well-developed nipple of a woman who has borne a child. A section through such a nipple shows a large quantity of unstriped muscle arranged both longitudinally and circularly round the ducts. The quantity of unstriped muscle arranged sphincter-like around the ducts is very remarkable, and undoubtedly explains the ejaculatory action whereby the milk is sometimes expelled in some highly sensitive women. The longitudinal bands of muscle are collected into fasciculi and pass towards the skin. A cavernous tissue has been described as existing in the nipple, but this, after the examination of a large number of specimens, I am unable to verify. The erection of the nipple under cold and mechanical stimuli is due to contraction of unstriped muscle, rather than to venous engorgement. The lining membrane of the interior of the ducts is plicated, and they are lined with a polyhedral epithelium. Doubtless when the nipple is erect, and lactation is actively going on, the tubes become straightened and distended, and the milk is hurried along them by ejaculatory action of the circularly disposed muscle fibres. In the marsupials the milk-ducts open on a flat hairless surface, and the milk can be ejected to some distance into the mouths of the young, by a special arrangement of muscle (compressor mammæ). The structure of the ducts and arrangement of muscle fibres are

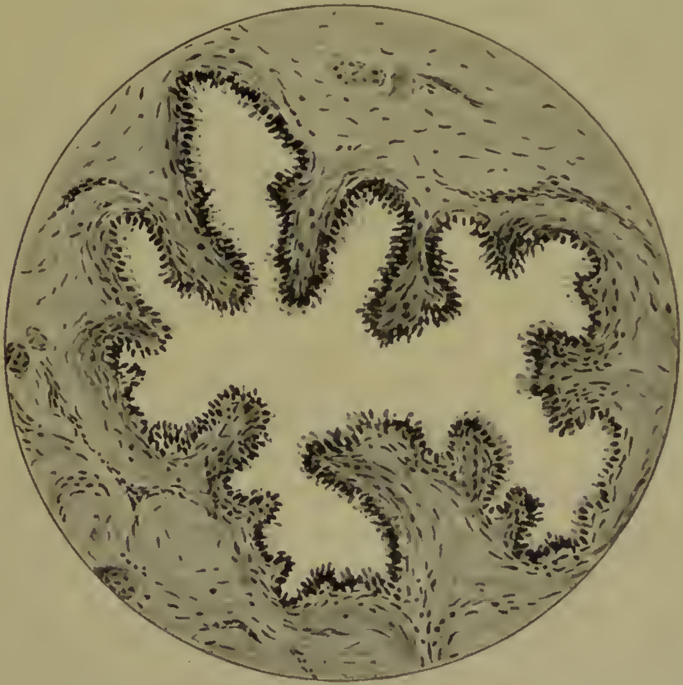

FIG. 3.—Section of one of the larger milk-ducts in the nipple. The excessive plication covered with epithelium is shown. This is easily mistaken for papillomatous growths.

beautifully seen in Figs. 2 and 3. In sections at the base of the nipple the sebaceous glands and sudoriparous glands, as well as the tubercles of Montgomery, may be evident. The surface of the nipple is covered with papillæ, which are complex, foliaceous and highly sensitive, containing Pacinian corpuscles. The contact of the mouth of the child with these, supplies the nerve stimulus needful to excite erection and ejaculation. The glands of Montgomery are merely small accessory glands similar in structure to the mammary glands; their ducts open near the base of the nipple.

The Milk.—For a complete account of the secretion and composition of milk the reader is referred to recent physiological works. A healthy wet nurse should secrete about one litre of milk daily, and, as the fats of milk are largely obtained by metabolism from the proteids of the food, a suckling woman should take about twice the quantity of food, especially proteid food, that she would take under ordinary circumstances. The fluid secreted during the first three days is termed "colostrum." Its characters are well known; thick and of a yellow colour, it contains large cells composed of aggregations of fat globules. These are undoubtedly due to the degeneration of the proliferating cells of the acini. Colostrum is rich in albumin, but the caseinogen is scanty. It is doubtful whether the milk proper is formed by cell degeneration. The secreting cells are often seen to be ragged on the surface, and to contain droplets of fatty material. The protoplasm of the cells is probably actively engaged, in separating the constituents from the blood, and discharging them, together with oil globules, into the acini. Healthy human milk is an alkaline emulsion, opaque and of a faint bluish-white colour; the specific gravity is about 1030. On standing, a distinct layer of aggregated oil globules (cream) should form on the surface. The taste is sweet, and there is sometimes a faint volatile odour, probably derived from the cutaneous glands in the immediate vicinity of the nipple.

In round numbers milk contains water = 87·5, proteid = 3·5, fats = 4, sugar = 5, and ash 0·6 (Waller). The fats of the milk are principally glycerides of stearic, palmitic and oleic acids, but traces of all animal fats may be found. The proteids of milk are caseinogen and lactalbumin (Halliburton). The coagulation of milk with acids or magnesium sulphate depends upon coagulation of the caseinogen, which is probably kept in solution in the milk by being combined with calcium phosphate. Rennet is a saline infusion of the fourth stomach of a calf. It contains a special ferment which precipitates caseinogen in neutral or alkaline milk, and its action is hastened by moderate warmth.

The lactalbumin coagulates at about 80° C. The salts of milk are those of potash, lime, and soda, the former being in excess.

It will be especially noted that micro-organisms have the power of coagulating caseinogen. Probably many organisms thus act.

Blue milk owes its colour to the development of the bacillus pyocyaneus, and this organism may be found in the serum of the milk. Red milk is due to the presence of micrococcus prodigiosus, which may grow with great rapidity in milk allowed to stand, and thus simulate blood. The colouring matter is probably fuchsin. Yellow milk is also produced by the growth of a bacillus. In "cattle plague" cow's milk may be red, owing to the presence of actual blood, or its colouring matter, and blood has been known to pass from the nipple in the human subject during lactation from a minute abrasion or rupture of one of the galactophoric ducts.

Rhys Griffiths[1] relates a case of green milk. Haliburton examined the greenish fluid, which in all respects resembled milk, and excluded the possibility of bile pigment. He concludes that the colour was due to an aromatic body produced by bacteria.[2]

Apart from the physiological interest of this subject, coloured milks would likely cause serious gastro-intestinal disturbances in the infant, hence their importance to the practitioner. Weaning must be insisted upon in such cases.

The colouring matter of the blood and bile may pass away with the milk, and so may pus and blood corpuscles. Also odorous foods, as garlic, will scent the milk, and many drugs, as iodine, mercury, lead, antimony, are known to be eliminated in this fluid. Cases are on record where fluids containing urea have issued from the nipples in instances of urinary obstruction. Birkett[1] seems to think these were well authenticated, and his opinion makes us cautious in casting doubt upon so curious a phenomenon, but I have never personally verified a case of the kind.

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[1] *Lancet*, 8th September 1894.

[2] Senn believes that greenish-blue milk is caused by the bacillus pyocyaneus (*Principles of Surgery*, p. 205).

Besides all this, the curious changes that occur in the milk under the influence of mental emotions, or in disease, render it clear that we do not thoroughly understand all the peculiarities of this fluid. The secretion of the milk is greatly altered by such emotions as passion, grief, mental depression, and it is well known that wet nurses are selected with a quiet and placable temperament.

Extraordinary instances are sometimes found of development of the mammary functions under stimulation at the extremes of life. A case is related[2] where a grandmother, aged sixty-one, gave suck to her infant grand-daughter. The old woman had been prolific in her youth, having on three successive occasions produced twins. As an instance of the opposite extreme, Baudelocq[3] relates the case of a little girl of eight who suckled an infant. When girls have become pregnant at the age of eleven or twelve, they have usually been able to suckle their infants, as in the case of Embling.

The following table will illustrate some of the principal cases which have occurred of early development of the mammæ and sexual organs. They may be of utility in a medico-legal point of view. There are many others in literature. Thus, two cases of enlargement of the breasts, and menstruation at the ages of nine years and one year, are related in the *British Medical Journal* for 11th September 1897. I have personally seen two cases of pregnancy at eleven and twelve years of age respectively, with full development of the mammæ.

Pregnancy at eleven, great enlargement of mammæ.—*Edin. Med. and Surg. Journ.* xxxviii. p. 231. Montgomery.

Menstruation at twelve months. Pregnancy at nine years of age. Great development of mammæ.—*Transylvania Med. Journ.* vii. p. 447. Rowlett.

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[1] *Diseases of the Breast*, p. 205.

[2] *Dublin Med. Press* for 30th August 1848, p. 130. See also Braithwaite's *Retrospect*, xviii. p. 376.

[3] *L'Art des Accouchements.*

Full development of mammæ and sexual system at three years of age.—*Lancet*, 29th Jan. 1848. Embling.

Great size of mammæ with menstruation in an infant of under two years of age.—Meckel's *Archiv für Anatomie*, 1827, p. 367. Dr. Dieffenbach.

Menstruation at two years. Full development of mammæ.—*Edin. Monthly Journ. of Med. Science*, p. 1050, 1842.

Undoubted instances are also recorded of the function of lactation having been performed by a man. One of the most remarkable and reliable cases of secretion of milk by the male on record is related by Mitchell.[1]

After the delivery of a woman aged thirty-six, her husband, a thin, spare man, became affected in two days with shooting pains in the breasts, headache, and nausea. On the third day, after a mild aperient and fomentation, milk began to flow freely; about three teaspoonfuls were taken away in a wineglass. The milk continued to be secreted for five days, and then gradually diminished. The fluid, after standing for a few hours, separated into two portions. The first or top portion contained bodies like fat-globules of a bright yellow colour floating on the surface. The second or bottom portion, when compared with a half-grain solution of indigo to an ounce of water, had a similar appearance.

Mr. Anthony Lozana, a schoolmaster, was presented by his wife with twins. To soothe the cries of the male child, he applied his left nipple to the infant's mouth, who sucked and drew milk sufficient for his nutriment. He was presented with eight other children, and shared with his wife the duties of suckling them. On the 4th March 1876, in the city of Cumana, before some of the notables of the town, Lozana filled a spoon with the milk of the left breast; the fluid was of a yellowish colour. He is described as being of soft fibre and delicate flesh. He had few hairs in his beard and none on his breast, his voice was feeble, and his eyes weak.[2]

A case is reported by A. M'Callum,[3] which seems to show that enlargement and inflammation of the breasts of boys at puberty may be associated with secretion of milk, and that masturbation is the most probable exciting cause. Considering the frequency of the latter practice in boys and youths, and the infrequency with which the male mamma secretes milk, this case is somewhat hypothetical.

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[1] *Brit. Med. Journ.* 1884, i. p. 493. An account is given in a MS. of Sir Hans Sloane of a woman aged sixty-eight who suckled her grandchildren. In vol. ix. of the *Phil. Trans.* a similar case is recorded of a grandmother of sixty, and another in vol. xli. of a grandmother of sixty-eight performing maternal functions. In the same volume a Bishop of Cork relates the case of a man who suckled his own children, but it does not appear that the prelate witnessed the act.

[2] Hunter's *Observations*, edited by Owen, vol. i. p. 238.

[3] *Brit. Med. Journ.* 14th June 1884.

Wiltshire[1] also quotes a case of an acquaintance of his, a famous naturalist, who at the age of puberty expressed a milky secretion from his breasts, and observed the same phenomena to occur every spring.

Galactorrhœa.—This term is rather loosely employed to denote two distinct conditions—(1) an excessive amount of milk during suckling, and (2) the abiding continuance of the secretion after the cessation of the period of lactation. In the first instance the secretion is generally to be lessened by free purgation and diminution of the diet; in the second, the milk generally lessens with the return of menstruation. There are no drugs which benefit these cases like the iodides of sodium and potassium in full doses, freely diluted. Belladonna or atropine is also very useful. Of course, should such remedies be exhibited, the infant must be weaned temporarily or permanently. A number of cases to illustrate the action of these agents are quoted by Birkett.[2] In one of them, quoted from the *Journal de Chirurgie* for January 1884, the milk flowed with such persistence and abundance that it filled the slippers of the patient, a young woman of about thirty. Iodine was, nevertheless, completely successful in checking the flow.

Lactation Immunity.—This important and interesting subject, though for adequate discussion belonging to the domains of higher pathology, may yet receive a brief notice, since its clinical significance can hardly be doubted. Nocard has shown that suckling goats easily succumb when anthrax bacilli are injected into the mamma by way of the lactiferous ducts. A goat rendered immune is unaffected, yet the bacilli live in the gland for an indefinite period, the milk secreted being virulent. Sheep inoculated with such milk die of anthrax. Numerous experiments go to prove (1) that the offspring of highly immune mothers suckled by a normal nurse are susceptible to the diseases from which the mother is immune, and (2) that the offspring of susceptible mothers suckled by an immune nurse, are immune to the diseases of which their mothers are susceptible. Thus Ehrlich finds that the milk of a pregnant goat, rendered immune to tetanus by daily injections of "thymus-tetanus bouillon mixture," possesses a high protective value. This milk injected into mice conferred upon them an immunity to inoculation with virulent tetanus cultures. The subject is well treated of in an article by my friend, Dr. George Buckmaster, in the *Science Progress* for May 1894. I refer my readers to this paper for further information.

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[1] *Brit. Med. Journ.* 1884, i. p. 654.

[2] *Diseases of the Breast*, pp. 194, 195.

Professor C. S. Sherrington, in an interesting paper on the escape of bacteria into the secretions, observes that Bollinger, May, and Bang state that the tubercle bacillus is sometimes present in milk when the udder is not the seat of local tuberculosis; they claim to have inoculated tubercle from the milk of tuberculous cows. Escherich has found cocci—namely, staphylococcus pyogenes aureus and albus—in the milk of women suffering from puerperal fever. In the same paper Professor Sherrington quotes Nocard, that when the bacillus tuberculosis is injected into the mammary ducts of the goat, the animal's milk remains long affected.

Sidney Martin, in the Report of the Royal Commission on Tuberculosis,[1] makes some most important observations on tuberculous milk, and the results of its ingestion. Perhaps we are hardly alive to the importance of selection of milk and inspection of cows when an infant has to be "hand-reared."

> Although the character of the disease produced was perhaps modified, and although in some cases the proportion of test animals affected was small, tuberculosis was nevertheless produced in guinea-pigs by intraperitoneal injection of milk, which, to instance a few of Dr. Woodhead's results, had been heated momentarily to 90° C., heated for twenty-two minutes to 75° C., for half an hour at 70° C., three hours at 65° C., or twelve hours at 50° C. After heating for a longer time at each of these temperatures, the milk appeared innocuous to guinea-pigs. It was found, however, that the results of feeding pigs with tuberculous milk afforded a still more delicate test of infectivity than inoculating guinea-pigs. Artificial tuberculous milk kept at 80° for ten minutes, or for a quarter of an hour at 75°, still remained infective when given to pigs as food. For any indications to the contrary furnished by these experiments, the infectivity to pigs may still exist in milk raised to higher temperatures

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[1] *Lancet*, 4th April 1896.

and heated for longer periods. This is all the more important as the analogy between the manifestations of the modified tuberculosis produced in the pig by this imperfectly heated milk and the "strumous" glands and other chronic tuberculous lesions of children and adults is an exceptionally close one—a point fully insisted upon by Dr. Woodhead. His experiments suggest doubts of the ability of several processes applied to milk under the name of "sterilisation" or "Pasteurising" to destroy the infectivity of tuberculous milk to man. The milk of cows with tuberculosis of the udder possesses a virulence which can only be described as extraordinary. All the animals inoculated showed tuberculosis in its most rapid form, such as is seen after inoculation with a recent tubercular lesion.

Polymazia.—Under this heading may be included a large class of cases as follows: (1) Supernumerary breasts with nipples; (2) supernumerary breasts without nipples; (3) supernumerary nipples without breast structure.

The subject of accessory mammæ is one of great interest, though such cases seldom come before our notice in practice. Champneys, in his paper on the development of mammary functions in the skin of lying-in women,[1] refers exhaustively to this peculiarity. In parturient women at the advent of lactation distinct "lumps" may be found in the skin of the axilla towards the hair-covered surface. These are devoid of nipples or true excretory ducts, but on squeezing them a secretion escaped. This was of three kinds—granular débris, colostrum, and true milk. A study of this paper makes it clear that these bodies are sebaceous, and that about the period of lactation they may enlarge and assume true mammary functions.

In some of these cases it is questionable whether the axillary swelling is not really a prolongation of the normal mammary axillary cusp. Thus Notta[2] relates the case of a woman who had a milk-secreting axillary mamma, but it was joined by a sort of cord to the true breast. There was no obvious areola or nipple in this case, and this is remarked upon. In fifteen similar cases recorded in France, a nipple or areola was stated generally to be present.

Adventitious breasts and nipples may occur in both axillæ, as in a case related by Ashley.[3] The axillary swellings were stated to be as large as a fowl's egg, and to bear rudimentary nipples upon them. A jet of milk issued from them when the infant suckled the normal breasts.

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[1] *Med.-Chir. Trans.* vol. lxix.

[2] *Union Med.* 13th January 1896.

[3] *Lancet,* 1846, ii. 227.

In a further communication to the Medico-Chirurgical Society on 11th June 1895 by Dr. Champneys and Mr. Bowlby, some modification is expressed of their former view that the skin glands of the axilla which take on mammary functions are actually sebaceous.

The glands are situated deeply in the situation of sweat glands, and much more deeply than the sebaceous glands, which are seen unaltered. The glands are of the tubular type, the deeper parts much convoluted, the terminal ducts nearly straight, and opening through interpapillary processes. The cells of the deeper parts appear to be columnar, those of the duct are polyhedral in two or three layers.

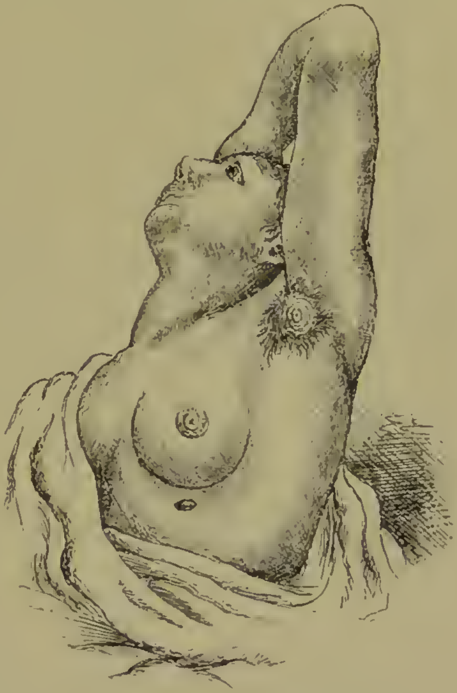
Fig. 4.—An axillary mamma. After Leichtenstern.

The conclusions drawn are (1) that the lumps consist of modified sweat glands; (2) the fact that various mammary secretions are produced by modified sweat glands seems to show either that mammary tissue is not necessarily a direct modification of sebaceous gland tissue, or that similar secretions can be produced by more than one variety of skin gland.

In this connection it may be remembered that the ceruminous glands of the ear which secrete "wax" are coiled-tubular, and not acinous in structure.

The microscopical characters above mentioned closely resemble a description given by Creighton in vol. lxv. of the Society's *Transactions.*

The functions of these milk-producing glands were verified by some of the most eminent obstetricians and careful observers of the day. The clinical significance of this matter is obvious. Such glands when enlarged may readily be mistaken for tumours and cause needless alarm, and there is good reason to believe that they may occasionally become affected with new growths.

An instance of a milk-producing axillary gland was related many years ago by Hare.[1]

A woman, aged thirty-seven, attending the out-patient department of University College Hospital, complained of a swelling under the right arm, from which milky fluid exuded. She had had seven children, her last confinement was two months before, and this symptom had never previously troubled her. She observed the swelling in her right axilla the night of the confinement. It was then as "large as a walnut." After a month it discharged a milky fluid, which gave relief to some painful symptoms in it. Dr. Hare was able to collect a drachm of the fluid by expression. He compared it with the breast milk, and proved the identity of the fluids. In his article he refers to a case of M. Champion of Bas-le-Duc, where a lady after her confinement got a swelling as large as a turkey's egg in the right axilla, from which milk exuded by "six little openings."

Supernumerary mammæ exhibit the greatest variety of form, and under the heading of polymazia may well be considered all those abnormalities, whether a mere nipple be present, or a nipple with breast substance, or breast tissue without a nipple.

R. Williams[2] speaks of having seen a young lady aged eighteen with well-developed breasts, but in whom the nipples were completely absent, being represented by a small transverse groove surrounded by a stunted areola. Menstruation was normal. It may be here noted that the mammary glands of the ornithorhynchus are destitute of nipples.

Although some supernumerary mammæ secrete milk, most of them are functionless. This interesting subject may well be prefaced by the remarks of Darwin in his *Origin of Species*. Organs bearing the stamp of inutility in a rudimentary condition are very common throughout nature. In all such cases disuse is probably the main factor at work. Thus the human female for many generations suckling the young, and using only the superior pair of mammæ for this purpose, the others in time disappeared.

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[1] *Lancet*, vol. ii. 1860, p. 405.

[2] *Diseases of the Breast*, p. 37.

Certain mammals, as the bat, have five embryonic mammæ, two situate in the middle of each half of the thorax, two in the axillæ, and one just above the umbilicus. It is curious to observe that in instances of supernumerary breasts in the human female these localities are commonly selected, breasts situated below the umbilicus or dorsally being extremely rare.

It is hardly enough appreciated by writers on teratology, that some globose fatty tumours in the posterior parts of the thigh, and about the buttock, have pap-like projections upon them, and present exactly the appearance of breasts, for which I have once actually known them taken. Indeed, without microscopical examination it would be difficult to settle the question. I have a shrewd suspicion that some of the supposed cases of mammæ in strange positions are really of this nature. In polymastic animals the mammæ hang along the side of the trunk from the axillæ to the groin, as may be well observed in the sow. Supernumerary breasts in the human subject found in these regions may thus be termed axillary, pectoral, abdominal, or vulval.

When redundant mammary structures are found on such parts as the back, thigh, face, groin, or median line we have to consider (1) that the evidence is often unsatisfactory, the structures having been confounded with warts, moles, or discharging sebaceous cysts. (2) In the few cases which appear to admit of no doubt, most pathologists are agreed that they are instances of curious excessive development on the part of a sebaceous gland taking on mammary functions. Other pathologists would, however, refer these strange cases to a retrogression towards those types of animal who bear their mammæ in curious positions.[1] According to Williams,[2] in three-fourths of all the cases observed, supernumerary mammæ are found below the level of, and internal to the normal mammæ. He concludes from this that our progenitors had a redundant pair of glands here long after they had lost the other supernumerary mammæ. This author states that in some lemurs a similarly placed second pair of pectoral mammæ is still of normal occurrence. I quote this author's opinions with the respect due to a laborious and earnest worker, but I am bound to say that the arguments respecting the explanation of abnormally placed mammæ by allusion to reversionary types, are to me far from conclusive.

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[1] For an account of animals which bear their mammæ in strange positions, especially the brachial mamma of one of the lemurs, see a paper by Sutton in the *American Journal of Medical Science* for 1889; also *Evolution and Disease*, p. 165.

[2] *Diseases of the Breast*, p. 59.

The only instance of median nipple I have ever noted, was in the case of a single lady seen by Dr. Mitchell Bruce and myself on 9th March 1896. About two inches above the umbilicus, exactly in the middle line, was a well-formed nipple, with an areola round it the size of a shilling, deeply pigmented. There was no trace of glandular substance to be felt.[1]

Most writers on anatomy, on diseases of women, and on mammary affections have noticed the subject of polymazia, and many instances of this affection are scattered through surgical literature. Supernumerary nipples with or without scanty mammary tissue seem to be more frequent in the male sex. Bruce in his well-known paper[2] examined upwards of four thousand cases consecutively, and found that sixty-one had supernumerary nipples. Of these, forty-seven were males, and fourteen were females. Generally speaking, this author found that supernumerary nipples occurred in about 7 per cent of the cases examined, but more frequently in males than females. Most instances are found on the left side according to Leichtenstern, and the rudimentary gland may be in the axilla, or in the course of the epigastric or mammary vessels, as pointed out by Sutton. It will probably surprise many readers to learn that this abnormality is so common. The fact is, rudimentary nipples are readily overlooked, being often mere pigmented papillæ devoid of areola, hairs, or papillary eminences. Thus in the autumn of 1895 a gentleman aged thirty-two, who was operated upon for hydrocele, begged me at the same time to remove some troublesome warts he had upon his chest. The supposed warts were two remarkably well-formed nipples situated internally and below the normal mammæ. Caustics had several times been applied to them under the supposition they were warts.

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[1] In the epitome of surgery issued by the *British Medical Journal* for 30th May 1896 will be found allusion to a case recorded by Patellani, where a supernumerary nipple communicated with some of the normal milk-ducts of the breast, the case being thus one of double nipple.

[2] *Journ. of Anat. and Phys.* vol. xiii.

Three, four, or even five breasts have been reported. According to Winkel, Gorré saw a woman in whom five mammæ were well developed, and Bué[1] relates a similar case. These and similar cases strongly support the theory of Hernsbach, as to the germs of human mammæ being analogous in number and position to those of the bat. Leichtenstern's oft-quoted paper is so complete, that it practically includes all that is known upon the subject. He has collected 105 cases, and the same tendency to anterior development is noted. He states that supernumerary mammæ never occur below the false ribs. Bruce, however, relates two cases which are exceptions to this rule. Moreover, Virchow,[2] on the authority of Barth of Berlin, speaks of a girl who wished to have a wart removed from her face. The growth was situated just below the right ear, was congenital, surrounded by a pigmented areola, and said to increase in size at the menstrual epochs. Microscopically, after removal, it was found to be a nipple. Again, M. Robert of Marseilles relates a case where a mamma the size of a lemon was detected on the outside of a woman's thigh. This case is quoted by Flint,[3] and seems sufficiently well established. In the *Lancet* for 24th August 1895 a remarkable case is figured by F. W. Adams. A male Hindoo aged about thirty-five had a tumour above the left hip. "In consistence and appearance it was exactly like the mamma of a virgin." The nipple was small and flattened, but the areola was perfect. No milk could be expressed. The man stated that the tumour had formed about the period of puberty, and had given him no trouble. A similar case is related by Witkowski.[4] The plate in his elaborate work shows a child sucking the mamma on the outer aspect of the thigh.

A large number of cases of abnormally placed mammæ are related and figured in the *New York Medical Record.*[1] Among other rare conditions, the author figures a mamma with a nipple on the posterior portion of the left thigh, near the gluteal fold, in a gentleman aged forty-six. "It is as large as the normal breast of a young woman, and its lobar structure can be distinctly determined on manipulation." He also figures the very uncommon condition of median nipples in a child aged seven. Cameron in his elaborate and excellent paper[2] states that these growths may occur in the abdomen or the groin. Shannon relates an excellent illustrative case in a woman aged thirty-four. The supernumerary breasts were placed near the axilla on either side.[3] The late Dr. Robert Lee in vol. xxi. of the *Med.-Chir. Society's Transactions* gives an excellent description of a woman who had quadruple mammæ. Sir A. Cooper verified this case. Dr. Lee here relates several

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[1] *Archives de Tocologie et Gynécologie*, June 1893.

[2] *Archiv f. path. Anat.* Bd. cxii. S. 569.

[3] *Physiology of Man*, vol. iii. p. 74.

[4] *Histoires des Accouchements*, p. 288.

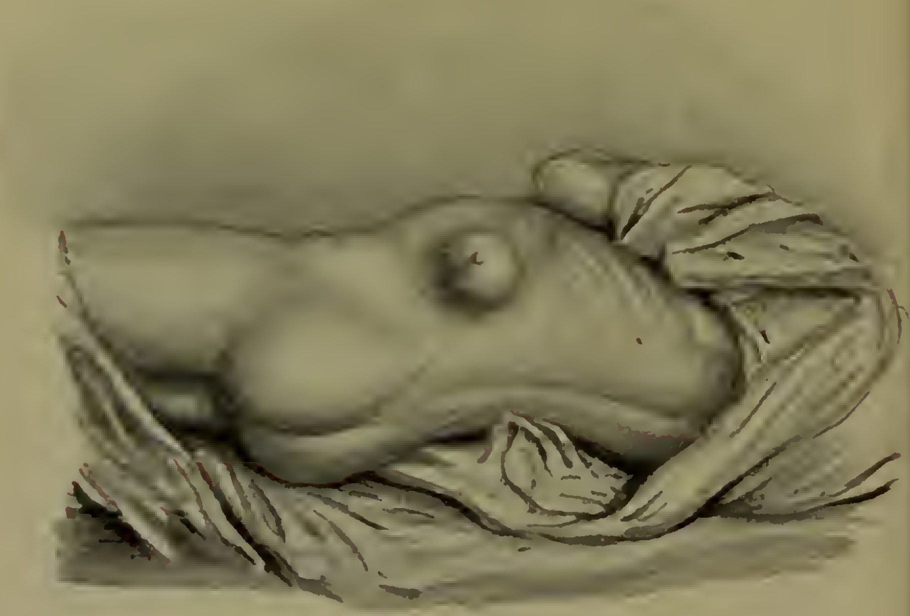

FIG. 5.—A mamma above the hip in a male. From a photograph by Adams.

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[1] *New York Med. Record*, 10th October 1891.

[2] *Journ. of Anat. and Phys.* vol. xiii.

[3] *Dublin Quarterly Journ. of Med. Science*, February 1848, p. 266.

other interesting instances of this affection. Thus he refers to Lynceus, who went from curiosity to see a Roman woman who had four breasts of a beautiful form ranged regularly one above another, and giving milk copiously. An old physician at Basle was consulted by a young heiress who had four mammæ, and who wished to know in the event of her marrying whether she would have three or four children at a birth. An aged woman who lived in the village of Pfellendorf in Germany was exhibited as a curiosity. She had four mammæ.[1]

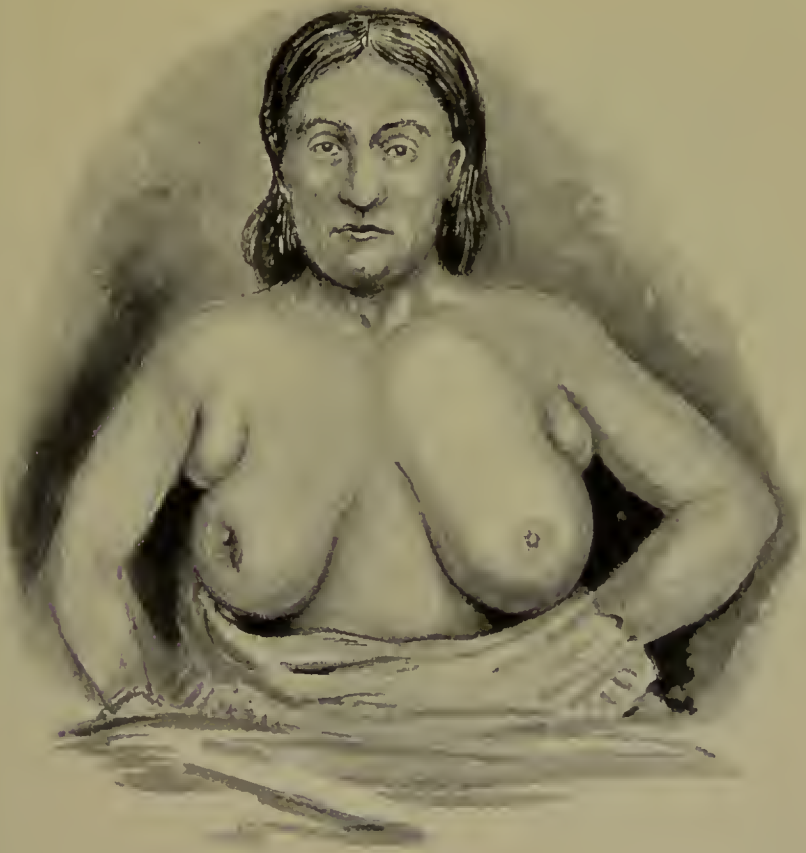

FIG. 6.—A case of quadruple mammæ. The right lower mamma is affected by carcinoma. From a photograph in the possession of Beatson of Glasgow.

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[1] The largest number of additional glands yet described is eight (Quain's *Anatomy*, vol. iii. part iv. p. 291).

Most writers notice the hereditary history sometimes observed in these strange cases.

It is at first sight extraordinary that supernumerary mammæ are sometimes found within dermoid ovarian cysts, though this ceases to be wonderful when we reflect upon the manner in which dermal structures of complexity are reproduced in these formations.

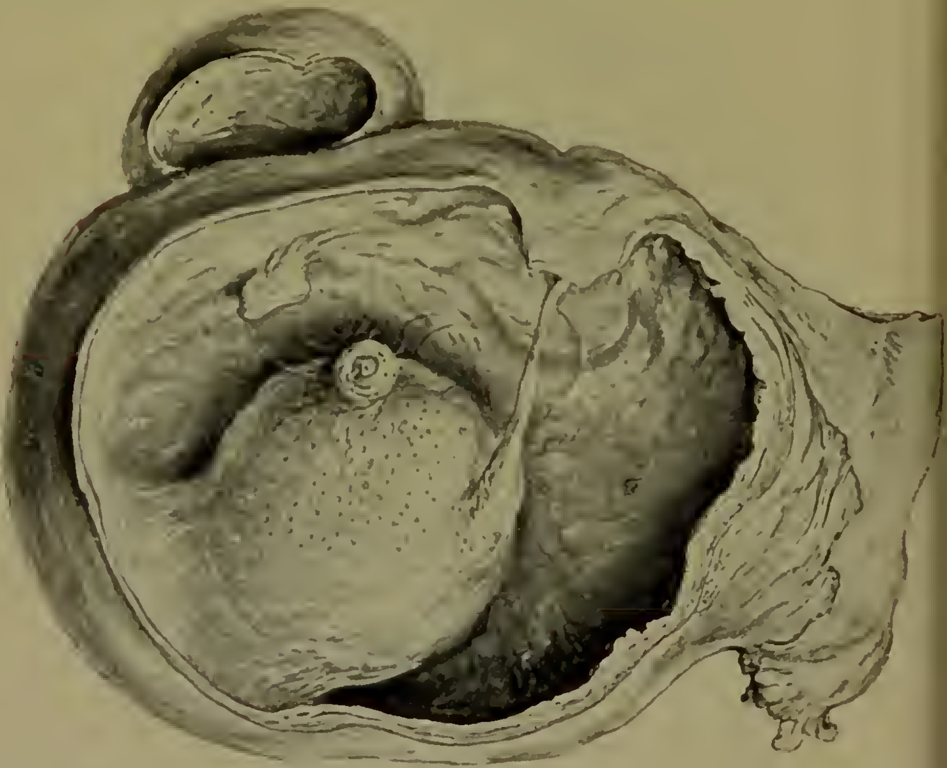

FIG. 7.—A mamma within an ovarian cyst. From a specimen in the Royal College of Surgeons.

Supernumerary mammæ occurring within ovarian dermoids are usually mere masses of shrivelled fat and sodden integument. Tufts of hair are common, and in some few instances a gland coming near to perfection is found. Those who are further interested in this curious freak of nature, will find excellent examples illustrative of mammæ in dermoid ovarian cysts in papers by Sutton and Samuel Shattock in vol. xxxix. of the *Pathological Society's Transactions.* In a specimen removed by Bantock, and examined by Sutton, the latter found ducts and gland tissue, but the epithelium differed from normal breast epithelium, and there was but a single duct. The tracing of the development of an ovarian dermoid mamma, from a lappet of skin to a gland capable of secreting modified milk, affords an additional proof that the mammæ are epidermal structures.

A young woman aged twenty-six was admitted into the Middlesex Hospital under Dr. Fowler with symptoms pointing to tubercular peritonitis. Abdominal section was performed and a large suppurating dermoid found and removed. It contained much sebaceous material and hair, and a rounded body on one of its walls, which was recognised as an ovarian mamma. In size this formation resembled a Tangerine orange, and had a small pink nipple, but no areola. It was mainly composed of fat, and in the centre was a cluster of glandular material, the ducts of which traversed the nipple.[1]

A good instance of a supernumerary mamma occurring without an excretory duct of its own, and becoming painful and swollen during lactation, is related by Bué.[2] Two days after the third confinement an axillary swelling developed on either side, giving rise to pricking sensations. The normal breasts were full of milk. The right axillary swelling measured 2½ inches in diameter, and over 6 inches in circumference, being separated by a groove from the normal gland. When the child was put to the right breast a distinct diminution in the size of the supernumerary mamma was observed. The left supernumerary gland was much smaller, and soon disappeared, but the right remained enlarged all the time of lactation.

Goldberger[3] records a case in which two accessory mammary glands without nipples were present. One lay in the hollow of the right axilla. At its greatest development it was of the size of a goose's egg. The second was placed on the thorax a little under 4 inches below the apex of the axilla, and somewhat anterior to the middle axillary line. It was larger than the right supplementary breast. At the end of the third week after delivery it underwent complete involution; the patient did not on this occasion suckle her child. The patient was thirty-two; the accessory mammæ had always developed during her pregnancies. When suckling she found that any cause, particularly suitable diet, which increased the flow of milk in the normal mammæ, caused the abnormal growths to become large and tense. The aspirating syringe was passed into one of the axillary breasts and true milk extracted, as proved by analysis.

On the contrary, milk may flow from the nipples of supernumerary breasts during lactation. Bryant[4] relates the case of a woman aged forty, the mother of eight children, all of whom she had suckled, who had a right supernumerary nipple. In all her pregnancies milk had flowed from it, but she had never practically used it. Cameron, in the paper already quoted, noted that milk flowed from an axillary nipple during lactation in one of his cases.

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[1] *Med. Press and Circular*, 22nd November 1893, p. 532.

[2] *Archives de Gynéc.* June 1893.

[3] *Archiv f. Gynäk.* vol. xlix. part ii. 1895.

[4] *Diseases of the Breast*, p. 10.

It sometimes happens that with polymazia abnormalities of the pelvic sexual organs exist. Bryant relates the case of a girl aged six who had a left supernumerary areola and nipple. There was in this case apparently no vagina, but a clitoris as large as a boy's penis was present, with a prepuce and urethral orifice. Similarly, the author in 1893 saw at the Waterloo Bridge Hospital a girl aged seventeen who had on the left side a hypertrophied breast, on the right two rudimentary nipples. There was an imperforate vagina and a large clitoris. The girl had never menstruated. Her intellect was feeble, scanty black hair grew on her upper lip, and her voice was harsh and masculine.

The treatment of polymazia is sufficiently evident. Supernumerary breasts and nipples may be readily removed should their situation or ethical reasons demand such a step.[1]

Hypertrophy of Breasts.—True hypertrophy of the breasts forming enormous tumours is a rare affection. Only two instances were noticed at St. George's Hospital in thirty-five years, and both of these were treated by pressure and mechanical support. They were not so progressive as to demand operation. An excellent example of the disease is reported by Fergusson and figured by Bryant. One of these breasts is preserved in the College of Surgeons' Museum, and is said to weigh 13 lb. A number of cases are collected by Birkett.[2] A case is related by Wardropp[3] of removal of an enormous mamma in an aged female. The weight was so great as to prevent her breathing when she lay on her back. The operation left the largest wounded surface that the operator had ever seen, yet under a dressing of lint and blood-clot rapid healing took place. Hey also related a case in a girl of fourteen, where the spine actually became curved from the weight of the glands.[1]

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[1] One of the most elaborate and excellent articles ever written on the subject of polymazia is by R. Williams in vol. xxv. of the *Journal of Anat. and Physiol.* The curious may find there full discussion on the subject of "mammæ eraticæ," as well as interesting observations on the strange positions of the breasts in some of the lemurs and other animals.

[2] *Diseases of the Breast*, p. 119.

[3] *Lancet*, 1832, 1833.

Allusion has been made to the physiological enlargement of the breasts at the advent of puberty and during pregnancy and lactation, and it has been exemplified that this enlargement differs very widely in degree. Accordingly, we are not surprised to find that occasionally the physiological processes stray beyond their ordinary limits, and morbid hypertrophy is the result. It is at least doubtful if true gland tissue is extensively reproduced in these monstrous breasts; connective tissue and fat are abundant. In a remarkable case, when a very careful microscopical examination was made by Krause, structure like "acinous adenoma" was found, and in one part was a nodule of a pinkish colour; the arrangement of cells was here rather of a sarcomatous type. This appearance has been also noticed by Billroth. Krause remarks that although the term acute diffuse fibrous hypertrophy is a good one clinically speaking, it does not adequately express the microscopical details.[2] There is no excess of secretion, but the cutaneous veins, especially in dependent parts, may become enormous, and Wenckel[3] notes that in one of his cases, where the breasts grew downwards to the umbilicus in about eight months, the general circulation was greatly influenced. A pathological examination of the tissue in this case showed difference of opinion. Klebs expressed the view that the growth was analogous to fibroma molluscum lymphangiectaticum, and described in it large numbers of lymph spaces lined with epithelium. These tumours may grow to an enormous size, and may be associated with abscess and fistula. So marked is the increase of fibrous tissue in some of these cases, that it appears like a definite morbid growth insinuating itself between the tubes and acinous pouches.

A remarkable paper by Porter,[4] too lengthy to quote in its entirety, is well worth perusal. He records the case of a woman aged thirty-seven in the Massachusetts General Hospital, whose breasts were of such enormous size they had to be suspended upon a frame. The patient was pale, emaciated, and her respiration was seriously embarrassed. After building up the general health, the breasts were successfully removed, at intervals of three weeks. The base of each tumour was transfixed by skewers, and an elastic band was used, so that little blood was lost. This patient, after recovering from the operations, died of erysipelas after her return home. Pathologically the growth was composed of fibrous tissue, which had insinuated itself between the acini and ducts (intracanalicular fibroma). The combined weight of the ponderous tumours was 60 lb.!

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[1] *Observations in Practical Surgery*, p. 500.

[2] *American Journ. of Obstetrics*, 1891, p. 697.

[3] *Diseases of Women.*

[4] *Boston Med. and Surg. Journ.* 3rd March 1892.

Porter gives a most interesting table of nineteen cases of this rare affection. The tables show (1) that the ages of the patients vary extremely; (2) that both glands are generally affected; (3) that no treatment short of amputation is of avail; and (4) that only one in sixteen dies. On the whole, the age of puberty appears most prone to the occurrence of the affection, which is so exceptional, that many surgeons of large experience have never met with a case.

The most recent reported instances of this exceptional disease I have met with are related by Dr. Burton in his review of gynaecological subjects in the year 1892. He refers to three cases of great hypertrophy of the breasts in females, aged respectively twelve, twenty, and forty years of age. In the little girl of twelve the breasts would have weighed 10 or 12 lb. each. This case was under the care of Sinclair of Manchester.[1] Zweifel[2] exhibited last autumn before the Leipzig Obstetrical Society a very lean primipara in the sixth month of pregnancy. She was 5 feet 2 inches in height, and 8 stone in weight. The mammae were very small before pregnancy, even for so thin a subject. They had, when exhibited, grown to an enormous size, the left being nearly 22 inches, the right over 19 inches in circumference. It was found that the hypertrophy was limited to the glandular tissue. There was no increase in the fat, and as the glands were entirely unsupported, they hung downwards. Owing to their weight the patient was obliged to support them with her hands when she walked. Colostrum issued from the nipples. The hypertrophied glands were not tender, but the patient was much depressed on account of the deformity.

An extraordinary case of hypertrophy of the breasts, terminating in sloughing and death of the patient from exhaustion, is related by Huston. The patient was a young negress aged sixteen. After death the right breast weighed 12 lb., and the left 20 lb. The circumference of the right gland was 24 inches, and of the left 42 inches.[3]

A young girl found after taking a bath that her menses were about to appear, and at the same time her breasts increased in size so rapidly that she could not be seen in public. When fifteen and a half years old her breasts were so large that they were supported on her thighs when she sat down. This condition remained stationary for eight years, when, notwithstanding her infirmity, she found a husband and became twice pregnant. It is extremely interesting to note that she was unable to suckle either of her children though the breasts became turgescent. When the woman was not pregnant, her breasts, like shrivelled masses of skin traversed by enormous blood-vessels, descended nearly to the knees.[1]

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[1] *Liverpool Med.-Chirurg. Journ.* January 1892, p. 138.

[2] *Centralbl. f. Gynäk.* No. 52, 1894, p. 1346.

[3] *American Journ. of Med. Science*, 1834, vol. xiv. p. 374.

A fatal case of acute hypertrophy of the breasts is described by Aitken, and, singular to relate, "secondary deposits" were described in the liver and ovaries. This case happened as far back as 1857, and we question whether modern microscopical research would not have put a different complexion on this case, sarcomatous tissue being present. The same remark may be made of a case of Sir S. Wells, published in the same article. It is interesting to compare these cases with the interesting observation of Krause regarding sarcomatous tissue in cases taken to be true hypertrophy.[2]

Velpeau relates a case noted by his dresser Deville, where, in a girl of seventeen, the right breast extended to a circumference of 21 inches, and the left to 15 inches. Sir Astley Cooper observed a hypertrophied mamma in a girl of fifteen, the circumference of which was 23 inches. Velpeau refers to cases by Chassaignac and Cooper where the enormous mammæ hung down to the pubes or knees, and weighed as much as 30 lb. Pètrequin saw a man at Pavia whose breast hung down 18 inches. It was extirpated with success, according to M. Vidal.[3]

One of the most remarkable cases of hypertrophy of the breasts I have personally heard of, came under the care and successful treatment of my friend Surgeon-Major C. B. Maitland in 1895. He kindly gave me the particulars with a photograph (Fig. 8). The patient was a reputed Hindoo virgin aged seventeen. One breast weighed 8 lb., the other 9½ lb., after a large quantity of fluid had drained away. The masses consisted chiefly of fat and fibrous tissue. The larger one was first removed, and the smaller a week or two after, by which

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[1] *Med. Times and Gazette*, 23rd November 1878, p. 608.

[2] *Ibid.* 11th April 1857, p. 359.

[3] Velpeau, *Diseases of the Breast*, p. 178.

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time it was less than three-fourths of its original size, owing to large vessels between the breasts being secured at the first operation, thus leading to diminished blood-supply. The operations were performed, with the assistance and under the supervision of Mr. Maitland, by his assistant surgeon, Mr. Postivala, in April 1892. The successful issue of the case is a striking instance of the ease and safety with which the great operations of surgery are now universally performed at home and abroad.

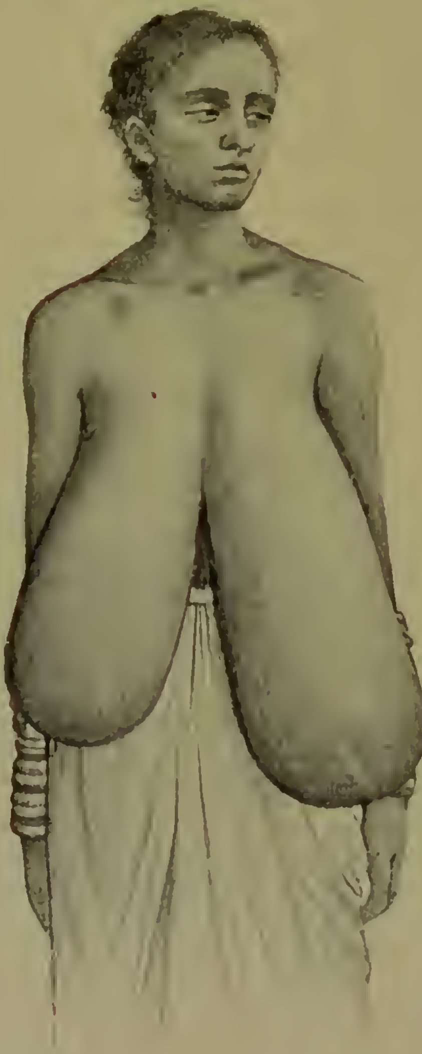

FIG. 8.—Hypertrophy of mammæ in a Hindoo girl.

Another recent case was under the care of Mr. Jowers of Brighton, who successfully removed the breasts at two operations. The girl was fifteen years of age. One breast weighed 4½ lb., the other 2 lb. They were of the nature of simple hypertrophy.

Hypertrophied Mammary Gland in Males.—Dr. John Wyeth, at a meeting of the New York Surgical Society, 10th January 1894, brought forward the case of a boy fourteen years of age. When eleven years old his left mammary gland began to enlarge, attaining the size of an adult fist. It then began rapidly to grow, and at the date of operation was double the size of an adult fist. It so closely resembled the breast of a fifteen-year-old girl, that a surgeon present doubted the sex. After removal it was pronounced to be "pure and unmixed hypertrophy."

Inspector-General Morgan reported a well-marked case of unilateral gynæcomazia in the male. The patient was an able seaman, aged twenty-one, and his right breast had been enlarging since the age of sixteen. It has now the appearance and development of the breast of a woman, and occasions him no inconvenience excepting when he goes aloft, when the breast knocks against the ropes.[1]

An exactly similar case, where one mamma only was hypertrophied, is reported as having occurred in a boy aged twelve, by Belcher.[2]

Double enlargement of the breasts in a boy of thirteen is also recorded as having occurred in Mr. Tuke's practice.[3]

Blomfield[4] draws attention to a peculiar enlargement of the male breasts met with in phthisis. Attention was first called to the subject by Leudet in a paper read at Grenoble in 1885. The affection consists of an enlargement of the glands without local induration or coloration of the skin, accompanied by a more radiating spontaneous pain. One gland is generally attacked, and suppuration never occurs. Blomfield quotes one case which fell under his own notice in a coachman aged fifty-six who had chronic phthisis. This man had rubbed the affected side with strong liniments, and it is questionable whether the friction and liniments so often applied by patients in phthisis, may not be really the cause of these curious mammary enlargements. Leudet surmised that the pulmonary inflammation extended to the mamma, but his evidence seems not conclusive.

Enormous hypertrophy of the breasts may occur in the male, and some of these cases are associated with atrophy of the testes (Laycock). Enlargement and hypertrophy of the mammæ in youths after atrophy of the testes from acute orchitis has not escaped the notice of Jacobson.[5] Mere heaping up of fat is generally observed, but other cases seem to be really glandular hypertrophy. Cases of gynæcomazia are exceedingly rare, and are found in the writings of Remauldin, Holtrop, and Gruber.

A soldier aged sixty was admitted into the Westminster Hospital in the year 1837. He had been engaged in military duties in Spain, where he received a severe injury to the cervical spine. Three weeks after this accident his breasts began to swell and become painful and the testes wasted. At the end of ten weeks the mammæ had enlarged to the size of an ordinary female breast. The gland in each case was perfectly developed, and the blue veins on the skin were as characteristic as those on the breast of a woman who has borne children. All desire for women ceased.[1] In the discussion upon the case Dr. Granville stated that he had had large experience of practice among eunuchs, in whom this phenomenon was not observed.

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[1] *Lancet*, 1875, vol. ii. p. 767.

[2] *Brit. Med. Journ.* 1890, vol. i. p. 364.

[3] *Med. Times and Gazette*, 1860. vol. i. p. 11.

[4] *Practitioner*, vol. i. 1886, p. 336.

[5] *Diseases of the Male Organs of Generation*, p. 451.

Remauldin, according to Laycock, mentions an analogous case in a lecherous young man who had an infantile penis and effeminate form. The late Mr. Durham showed at the Pathological Society in 1859 a young man aged twenty-five "very like a girl in his manner." The general appearance of this youth was decidedly feminine, and the breasts were large and prominent; in size and appearance they resembled those of a young virgin. The testes and penis were small, and upon the upper part of

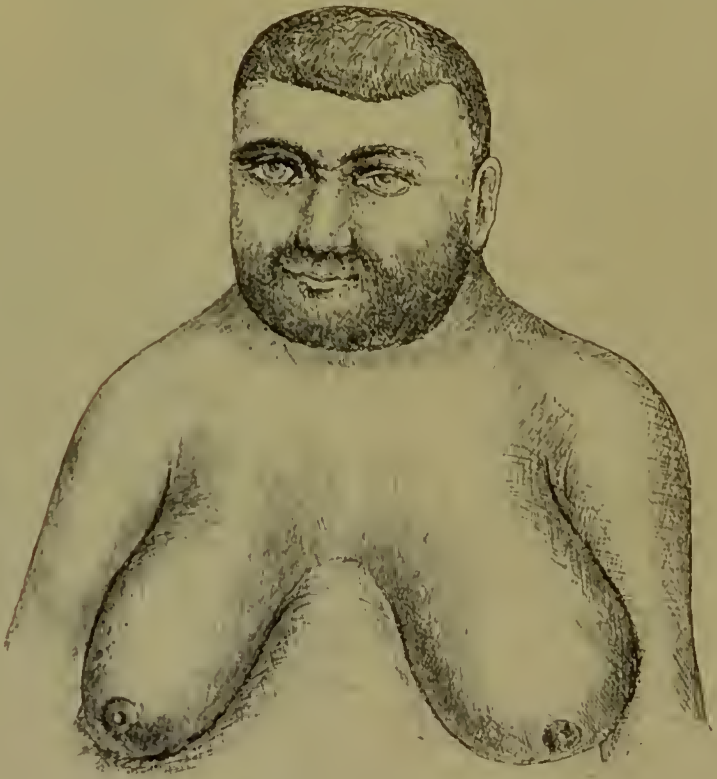

FIG. 9.—A case of gynæcomazia. After Gruber.

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[1] *Lancet*, 1837.

each testis was a small oval body composed of fibrous tissue and fat.

Mr. Hutchinson, in the *Archives of Surgery* for 1895, observed that the mammary glands of a young man of twenty-three, whose penis and testes were retracted with pain, and who was impotent from sexual excess, had taken on such active growth that they were as large as those of many women. In reference to this case he remarked, that he had on several occasions observed overgrowth of the mammæ, in men whose sexual functions were in abeyance.

An excellent illustration of gynæcomazia is given by Hutchinson in his *Archives of Surgery* for April 1895. He believes that this condition is found among the Zulus and other African races, and applies to it the term of "Lobengulism." On inquiry among medical men who have been in these districts, I find that this condition in a marked degree is far from common. It is an error to suppose that the enlargement of the breasts in males is due to increase of gland tissue, or that they approach in structure the mammæ of the female. The enlargement is proved to be due on histological examination to a heaping up of connective tissue and fat. The glandular tissue normally existent takes part in the hyperplasia.[1]

Enlargement of the Breasts in Elephantiasis.—So far as I know, attention has not prominently been called to this subject. In an article on Elephantiasis Arabum in the South Sea Islands by Manson, mention is made of enormous enlargement of the breasts in elephantiasis, and a portrait from two photographs by Dr. Davies of Samoa well represents the condition observed. The elephantiasis is proved by the coincident enlargement of the left leg. A case where the breasts hung down to the level of the umbilicus in a negress of St. Lucia is briefly mentioned in the *British Medical Journal* for 1883.

I am indebted to Dr. Manson for the notes of another case of elephantiasis of the breasts communicated by M. Leroff of the Kasan Hospital in Russia. The patient was a well-developed and healthy woman, aged twenty, who had been recently married and borne a child. Towards the seventh

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[1] As regards the reputed commonness of gynæcomazia among the Cingalese, Dr. Leslie writes to me from the Lady Havelock Hospital at Ceylon to say he had never heard of or seen a case (10th June 1896).

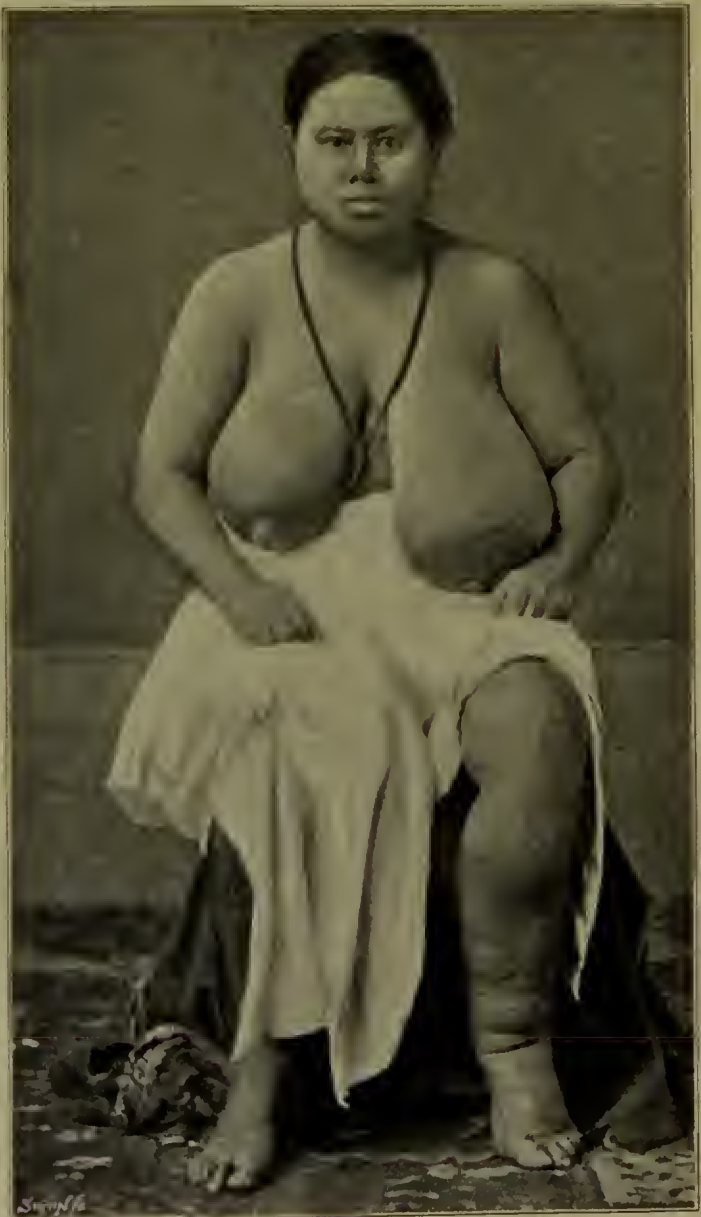

Fig. 10.—Elephantiasis of mammæ. From a photograph by Davies of Samoa.

month of gestation she noticed a singular enlargement of the right breast, with a thickening of the skin near the nipple. Soon after, the malady attacked the left breast, and both glands progressively increased, the skin especially being hypertrophied. She was unable to suckle, and the breast hung down to the navel, while her general health commenced to suffer. A long description is given of the coarse wrinkled condition of the skin. The author discusses at length the reasons why he regards the case as one of elephantiasis, though it must be confessed that his arguments admit of dispute. An excellent illustration of the case is given. The breasts were amputated with success, and examined by Professor Lubéinoff, who pronounced them to be genuine elephantiasis.

Enlargement of the breasts in association with intermittent fever has been noticed, and is worthy of remark in connection with this part of the subject. Sulphate of quinine has been found efficacious in such cases.

Before undertaking the operative treatment of hypertrophied breasts, careful consideration must be given to the possibility of the adoption of minor remedies. The recumbent position, elevation, and pressure should be employed. The diet should be dry and spare, and iodides of potassium and sodium should be freely given. The following case illustrates the efficacy of these measures :—

A young woman æt. twenty-one, who had been married for one year and had never been pregnant, applied at St. George's Hospital in May 1897, on account of pain and increase in size of the mammæ. The enlargement had only been noticed for eight weeks ; they had increased in size very rapidly. The patient was a pale, tuberculous-looking woman. The mammæ were of large size, and reached to a point near the umbilicus. They were marked by large venules, and felt knotty and irregular, as though masses of solid tissue existed. After a fortnight's rest in bed, with purgatives and the free administration of iodide of potassium, the congestion and hardness disappeared. The bulk of the mammæ, however, did not diminish. Menstruation was normal, and did not seem to influence the condition one way or another. The breasts were well "slung up," and compressed with large pads of wool. Small quantities of fluid were allowed, and dry dietary. Iodide of potassium was administered in full doses. In a month the left mammæ had reduced in size, and the right was not so painful and congested. A trial of elastic pressure was now advised, but the patient left the hospital. I have seen the case recently. The breasts are slowly diminishing under full doses of the iodides. The left had returned nearly to its natural size, the right still remains large and bulky. The future of the case remains dubious. Should pregnancy occur, formidable increase may again be expected.

Should the enlargement be very sudden, and associated with suppression of the menses, free leeching should be applied to the thighs or vulvæ, or the old-fashioned remedy of bleeding from the saphena vein may be adopted. In such cases also an attempt may be made to induce lacteal secretion by cupping over the nipple.[1] Still better would be the daily application of an infant to the breast. In well-established cases of hypertrophy, all such means will prove of small avail. The greatest care must be taken not to confound true hypertrophy

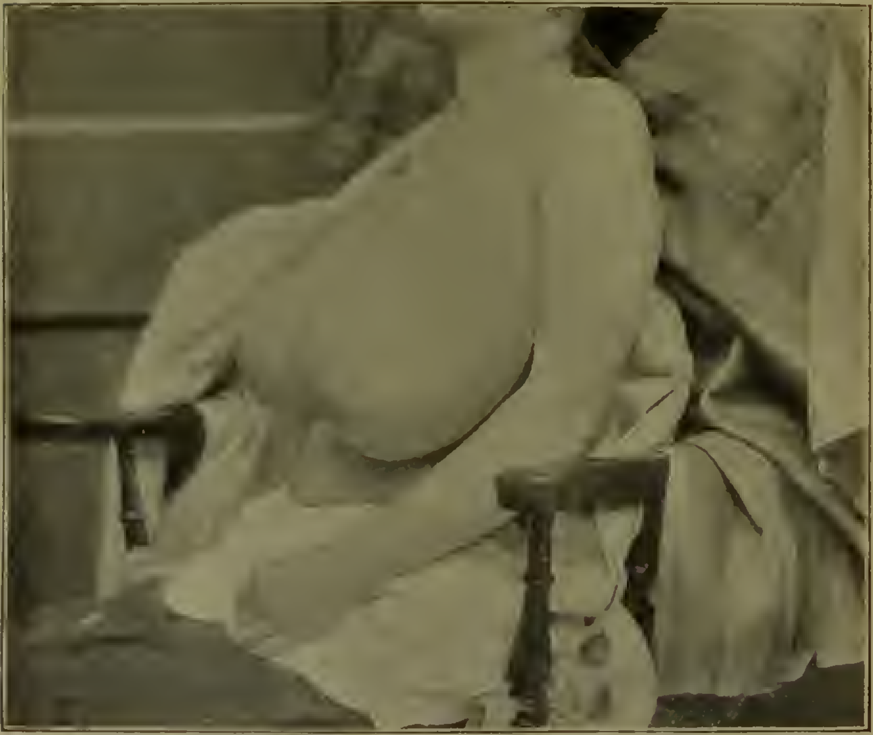

FIG. 11.—Acute hypertrophy of the mammæ in a woman aged twenty-one. From a case under the care of the author.

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[1] Fingerhuth, quoted by Birkett (*Diseases of the Breast*, p. 122).

with the growth of a huge adenoid or lipomatous tumour, which displaces and flattens the gland, and yet may safely be removed leaving the breast untouched. A typical example may be seen in St. Mary's Hospital Museum.[1]

A huge lobulated fibro-adenoma measuring 18 inches round the base was easily enucleated from the breast of a girl aged thirteen ; not a single vessel required ligature, and the mamma was left intact. As a striking instance of the similarity of these large tumours to the affection we are considering, this case was actually shown at the examinations of the Royal College of Surgeons, as a typical instance of hypertrophy.

When all minor plans of treatment fail, removal by operation may be safely undertaken, and is the only method likely to be followed by good results when the growths progress and are very large. Careful asepsis of the skin should be carried out, and ulcerations or sinuses should be cleansed with pure carbolic acid, and packed with iodoform gauze. Should the huge pendulous masses be œdematous and full of blood, it is of the utmost importance that this condition be ameliorated by position and bandaging. For some days prior to the operation the patient should keep the recumbent position, and the parts must be well raised and bandaged with a broad bandage of elastic webbing. The reduction in weight and size will be very marked, and the trouble from bleeding and oozing much lessened. Ample skin-flaps being raised, the mass may be removed, a capable assistant rapidly putting pressure forceps on bleeding points. Should the great tumour be of the nature of molluscum, and contain many and large vessels and sinuses, the following modification may be adopted. After turning down the skin-flaps, two strong pins are passed through the growth at right angles to each other, and a piece of fine elastic tubing is wound round tightly below them. The growth is now cut away. Any discoverable large vessels or gaping sinuses are secured. The tubing being relaxed, other bleeding points are secured. A large flat sponge wrung out in turpentine may be pressed upon the surface should troublesome oozing occur. In this manner all such growths may be removed with comparative safety, as well exemplified in Porter's case.

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[1] Museum of St. Mary's Hospital. No. 1457.

The extensive cut surface may with advantage be flushed with hot sterilised water. The question of removing both tumours at one operation is always an anxious one. Should any symptoms of shock or collapse be associated with removal of the hypertrophied breast on the left side, the operation on the right side had better be postponed. In Crofford's case, of acute mammary hypertrophy in a young girl, where the tumours after removal had weighed as much as 13 lb. and 11 lb. respectively, some valuable hints are given respecting the operative treatment of these cases. Lateral flaps were made, but it was found impossible to cut into the breast substance, so profuse was the haemorrhage. Accordingly the skin was peeled away, with the handle of a scalpel and the fingers, and the mass removed with a portion of the pectoral fascia and muscle. The operators were much struck with the absence of bleeding vessels at the actual base of the tumour; there was no bleeding beyond a "moderate oozing," and the vessels of the skin seemed to principally supply the tumours. The right gland was amputated on September 16th, and the left on October 2nd. The patient made a rapid recovery. Bouyer, according to Birkett, removed two of these formations at the same operation with success, the patient losing one-third of her total weight. A case[1] where the tumours were of more moderate size, and were successfully removed at one operation, is related by Mr. Stanley Boyd when registrar to University College Hospital. The patient was forty-one years of age, and the breasts had been enlarging for eleven years. In all these cases, emptying of the tumour of blood by elevation and pressure is one of the most important steps, and should never be neglected; and the larger the masses, the more the reason for removal by operations, separated by some weeks' interval. The larger of the two breasts should be removed first, in the hopes that the smaller may subsequently shrink in size. Enormous enlargement of one breast, should always lead to the suspicion that a definite tumour exists simulating hypertrophy, and that the case is not one of true hypertrophy, which appears to be generally if not always bilateral.

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[1] *University College Hospital Reports* for 1881, p. 40. Recently at King's College Hospital hypertrophied mammæ have been removed weighing 9 lb. 10 oz. and 9 lb. 4 oz. respectively. *King's College Hospital Reports*, 1897, p. 116.

It may perhaps be worthy of mention that hypertrophy of the male breasts is alluded to by so ancient an author as Paulus Ægineta, and he mentions the advisability of excising by elliptical incisions portions of the hypertrophied tissue. The suggestion is a very excellent one. By lifting up one of these hypertrophied breasts, and excising a large portion of it from below, saving the nipple, the normal size and contour of the male breast may closely be restored, the scar being hidden inferiorly. I should not hesitate to put this into practice if one of these rare cases ever presents itself to me in the male. In the female, I fear that such operations would be of little avail, and would be attended by very troublesome hæmorrhage.

Amazia. Micromazia.—Complete absence of the breasts, and more rarely of the nipples also, has been noted from time to time. The mammary glands may be congenitally small and withered, and devoid of well-formed glandular structure, as tubes and acinous pouches. It has been already pointed out that many thin and tall women, especially those who approach the masculine type in figure and disposition, have flaccid and ill-developed mammæ. In true micromazia, however, no enlargement takes place at puberty, the breast maintaining the infantile type. A perusal of these cases scattered through literature, shows that in a considerable proportion of them the pectoralis major is also deficient, especially those fibres of it which have a sternal origin.

Greenhow relates a remarkable case of absence of the mammæ in vol. xlvii. of the *Med.-Chir. Trans.* The plaster cast which is there figured shows rudimentary nipples in the usual positions. The pelvic generative organs were atrophied or absent. There was also congenital heart imperfection, and partial want of development of the sternum. Greenhow mentions the case of Ann Joseph, related by Pears in the *Philosophical Transactions of the Royal Society* for 1852. Her breasts and nipples remained of the male type, and post-mortem the pelvic genitalia were in the infantile condition.

Baynham's case in the third volume of the *London Medical Gazette* is similar to the above.

In a case of severe hereditary syphilis related by Rivington, there was general enlargement of the lymphatic glands in a stunted girl of sixteen. The mammæ remained undeveloped, and she had never menstruated.[1]

In a case related by Froriep of absence of the right mamma, the greater part of the pectoralis major and serratus magnus, as well as some of the costal cartilages, were deficient. A preparation of malformation of the genital organs was shown by Pilcher at a meeting of the Medical Society of London on March 5, 1838. This was removed from a lady aged sixty-five, who had always been of a "reserved character." The pelvic genitalia were rudimentary, but the clitoris was large. What is of interest here was the entire absence of the mammæ. This lady had never menstruated, and she had a "tremendous beard."

Caillot and Remauldin also published cases where the pelvic generative organs were infantile, and the breasts remained atrophic.[2]

Undoubtedly, one of the most excellent accounts of this peculiar deformity of congenital absence of the pectoral muscles and breasts ever given, is an article by Thomson in the *Quarterly Journal of Antenatal Pathology* for January 1895. He relates three cases, and gives a list of eighty-nine others. He finds that the structures deficient are the hair in the axillary and mammary regions, the pectoral fat, the nipple and breast, the pectorals and some of the adjacent muscles, the costals and ends of the ribs, the hand and forearm. These deformities differ in number and extent in various cases, but the sternal pectoral is always affected. He alludes to the observation of Froriep, that the upper limb of the affected side is probably concerned in the defect, and that the hand and arm are deformed in a considerable proportion of the cases. In a case of Ritters, in a child of ten days old, the deformed upper limb accurately fitted into the thoracic gap. It appears, therefore, that this condition may possibly be caused by some ill-understood intra-uterine pressure and malposition of the upper limb. This paper will well repay perusal by those interested in the subject. It may be pointed out that this condition of absence of the pectoral muscle and mamma, is far more common in males than in females. I have seen the following cases :—

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[1] *Medical Times and Gazette*, vol. ii. p. 432.

[2] *Memoires de la Société Médicale d'Emulation*, ii. pp. 470-6.

A tall muscular negro, aged twenty-eight, a native of Demerara, came to St. George's Hospital on 7th April 1897. On the right side the sternal portion of the pectoralis major was quite absent. There was a triangular gap in the thoracic walls, 6 inches long by about 3 broad, reaching from the axilla to the seventh rib. When he coughed, the tough diaphragm which covered in this deficiency distinctly bulged outwards. The breast was entirely absent, the nipple being merely represented by a small pigmented spot. The condition caused him no inconvenience.

In December 1897 Dr. Ogle sent to me a hospital patient, a man aged fifty-six, for cancerous stricture of the œsophagus. The sternal part of the pectoralis major was entirely wanting on the right side. The breast was absent, but a faintly pigmented nipple was apparent.

Rosignol found rudimentary mammæ in a patient who also was devoid of a vagina, and total absence of the uterus and ovaries has been noted. This is not invariably the case, however. Wylie[1] relates a remarkable case of complete absence of both breasts in a woman aged twenty-one. She menstruated regularly and became pregnant, and had no pain or inconvenience of any kind about the thoracic walls.

Wenckel[2] gives an excellent account of amazia, and quotes examples from Säxinger, Lousier, and Schlözer. Cooper and Laycock have reported similar cases, and the subject is well summed up in an excellent paper by Williams.[3] He alludes to the curious history of mothers during pregnancy being alarmed, at seeing the chest of a woman who had undergone amputation of the breast, and whose offspring suffered in consequence from amazia. A case of congenital absence of both hair and mammæ in a boy aged three and a half years is reported by Hutchinson.[4] The mother of this child had suffered from alopecia areata since the age of six. Birkett, whose experience was very extensive, writing in 1850 had only met with one case of amazia. In acephalous monsters, deficiency of the mamma and part of the chest-wall is sometimes met with.

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[1] *Brit. Med. Journ.* 1888, vol. ii. p. 235.
[2] *Diseases of Women.*
[3] *Journ. of Anat.* vol. xxv. p. 304.
[4] *Med.-Chir. Trans.* vol. lxix.

A remarkable case of total absence of one mammary gland is related in the *Lancet* for 14th June 1862, by Mr. F. Paull. He was called to attend a woman in her confinement, and afterwards was surprised to find that she had only one breast ; the other was represented by a pimple, the pectoral muscle being also deficient. Her mother attributed the defect to being frightened at the third month of pregnancy, by seeing a woman expose the marks made by the removal of her breast for cancer, in order to obtain alms.

Chambers, in his case of removal of the ovaries on both sides from hernial sacs, reports that after the operation the left breast almost disappeared, while the right remained unaltered.[1] Both breasts, with the pelvic generative organs, may shrivel after removal of both ovaries.

Pott relates that a young woman, aged twenty-three, was admitted into St. Bartholomew's Hospital for two small and painful tumours in the groin. Mr. Nourse "let blood and purged her" without benefit. He found the tumours got no better, and were quite irreducible. The tumours were removed, and at the operation on either side bodies were found "so like the human ovarium that it was impossible to take them for anything else." After the operation she became thinner and more muscular, and her breasts, which were large, disappeared.[2]

Atrophy of the mammæ after removal of the ovaries is certainly not universal. I have made especial inquiries on this point.

The late Dr. Remfrey exhibited at the Obstetrical Society of London, in 1894, a woman who had nipples but apparently no breasts. The following are his notes :—

Patient aged twenty-six. Thin. Expression dazed. Intellect somewhat weak. Pinkish gray areolæ measuring exactly half an inch in diameter. Nipples about one-sixteenth of an inch high. No secretion. No breast structure felt. *Hair*, normal amount on head, arm-pits, mons veneris. *External genitals* normal. *Vagina* conical, at apex a small opening admitting sound half an inch. On bimanual examination some thick fibrous tissue felt against which sound impinges, equal to about the size of a pea. No trace of tubes or ovaries felt.

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[1] *Trans. Obstet. Soc.* vol. xxi. p. 256.

[2] *Surgical Works*, vol. iii. p. 330.

These conditions admit of no treatment, and are important to the practitioner from a medico-legal point of view, and also as regards the question of marriage. Here much will turn on the condition of the pelvic generative organs, which in such cases should always receive an elaborate and careful examination.

CHAPTER II

ACUTE MASTITIS AND THE VARIETIES OF MAMMARY ABSCESS

General statements—Etiology and predisposing causes—Congestions and engorgements—Abscess and mastitis in infants—Pathology—Occasional origin in tubercle, hæmatoma, pyæmia—Position of abscess in gland—"Hour-glass" abscess—Galactophoritis—Glycosuria and abscess—Symptoms and diagnosis—Confusion of acute abscess and inflamed carcinoma—Chronic abscess; tuberculous origin of—Actinomycosis—Illustrative cases of mastitis and abscess—Mastitis of mumps—Mastitis of typhoid fever—Mastitis terminating in gangrene—"Diffuse phlegmon"—Abscess and mania—Treatment of inveterate sinuses—Chronic abscess confused with tumours—Chronic abscess depending on necrosis of a rib following traumation—Suppuration in association with tumours and cysts—Further remarks on treatment and prophylaxis—Author's method of draining mammary abscess—Hæmorrhage after opening—Death from fat embolism.

General Particulars.—I have collected and studied 189 cases of mammary abscess occurring at St. George's Hospital between the years 1865 and 1895. This is not the total number, for the notes in some are rather incomplete, and many cases were treated as out-patients. This number is, however, sufficient to give us results of value concerning age, causation, and other such particulars, which serve as a useful introduction to the subject. Out of the 189 cases only 3 occurred in the male breast, and this leaves 186 for study in the female. In 180 of these the ages are given as follows:—

Before the age of 20 there occurred				. .	31 cases.
Between 20 and 30			„	. .	97 „
„	30 „ 40		„	. .	29 „
„	40 „ 50		„	. .	16 „
„	50 „ 60		„	. .	7 „
					180 cases.

This table shows us that the common age for mammary abscess is during the period of active married life. Abscess is comparatively rare in early life and in old age. There were no cases related of mammary abscess in infants, these being almost invariably treated as out-patients. The youngest case related was eleven, the eldest sixty years of age.

As regards causation, in 114 cases the abscess was directly attributable to suckling and lactation, and the periods at which such abscesses occurred may thus be presented :—

In the	first	month after	parturition	there happened .	. 33 cases.
,,	second	,,	,,	,, .	. 42 ,,
,,	third	,,	,,	,, .	. 12 ,,
,,	fourth	,,	,,	,, .	. 2 ,,
,,	fifth	,,	,,	,, .	. 20 ,,
,,	sixth	,,	,,	,, .	. 3 ,,
,,	seventh	,,	,,	,, .	. 2 ,,
					114 cases.

The earliest time after parturition was eleven days, the latest, nine and fourteen months respectively, the women still suckling. These periods can only be approximately correct, as the times when the abscess was opened are alone trustworthy, the history given by hospital patients being very unreliable. These results serve to show that abscess after parturition is most common in the period between the fourth and eighth weeks, and again towards the fifth month. In two cases only the abscess occurred during pregnancy—in one at the fourth month, in the other just before confinement.

As regards the causation of the remaining 72 cases, doubt must be expressed; at least 4 were certainly tuberculous, and 2 were associated with "fistula in ano." In 37 cases the abscess could be definitely traced to a blow, but many of the patients were suckling at the time. In 3 cases the abscess followed operation for "adenomatous" tumours, the wound being healed superficially, and pus collecting below. In 2 instances necrosis of a rib was found to be the cause. In a considerable number of cases, especially in elderly women, there were distinct histories of previous suppurative affections of the breast. I could not find enough reliable evidence upon this point to state the proportion in figures, but in four instances the abscess formed and burst in the exact site of the former one. These four cases were in women over forty years of age. There was no known cause for their suppurative affections, and the pointing of the abscess took place in the actual scar of the older abscess four, seven, ten, and sixteen years respectively after the ancient trouble. So far as situation was concerned, the majority of the cases were certainly intramammary. In only six cases, to my surprise, did the abscess seem to have formed really behind the mamma itself. Both breasts were affected in sixteen instances. In the 189 cases, the left breast was affected more commonly than the right, whereas in 200 cases previously collected by myself from various sources, the abscesses of the right mamma slightly predominated. The abscesses occurring in women of over forty were all chronic, and hardly any of them were correctly diagnosed before exploratory incision. This is a most important matter, which comes out clearly in these researches.

In like manner I have studied 60 cases of abscess of the mamma admitted into University College Hospital for six years, from 1884 to 1890, selecting that period, because then were full particulars given of the nature of the abscesses and the time they occurred after lactation. Of the 60 cases, 51 were associated with pregnancy or lactation in women of varying ages. The left breast slightly preponderates in order of frequency of attack. Of cases of chronic abscess there were 8 occurring between the ages of thirty-five and fifty-one years. In one of these, blows were mentioned as a likely cause. Several of the chronic abscesses were only differentiated from scirrhus by exploratory incision, being associated with excoriations of the nipple, and in one the nature of the contents seemed likely to show that the supposed abscess was really an ancient galactocele with inspissated contents. One case of acute superficial abscess occurred in the male breast just beneath the areola, and no cause could be assigned for it. Of 102 cases of abscess related by Bryant,[1] 79 occurred during lactation, 2 during pregnancy, and 21 in non-lactating, non-pregnant women. Birkett,[1] in examining 149 cases of mammary suppuration, noted that 132 of them occurred in suckling women. Among 72 cases published by Nunn, 58 occurred in lactating women, 7 in pregnant women, and 7 in non-puerperal women. Of 230 cases collected by Jamain and Terrier,[2] 183 were connected with the puerperal state, 47 occurred during pregnancy, and 34 were not connected with either condition. McClintock[3] preserved notes of 82 cases of mammary abscess, and found the preponderance on the left side. Of all the abscesses he had seen the vast majority made their appearance during the first six weeks of lactation. As regards the time after parturition that mammary abscess occurs, I find the greatest variability. Some of the cases happen as early as the first, others not until the fourteenth month. Birkett[4] found that in 116 cases half of them occurred as early as the first month after parturition, and a large proportion of these as early as the first week. In 50 of the St. George's Hospital cases collected by myself, where the time after parturition is accurately noted, the majority occurred later than this, 38 cases occurring in the period between the second and the fourth months. Bryant[5] found that out of 102 cases 68 occurred in the first two months after pregnancy. It would seem very difficult, if not impossible, to strike an average regarding the exact month at which lactation abscess is the more common; but Nunn, Birkett, and Bryant are all agreed that this affection is most frequent in the early and late months of pregnancy. Birkett[6] estimates that half of the cases are associated with defective or sore nipples. Personally, I believe the average is far higher than this, and I have never seen a case of acute mammary abscess in a young woman without being able to observe, by the aid of a lens, breaches of surface in the vicinity of the nipple, by which organisms might readily enter the lymphatic channels. Through the courtesy of Dr. Griffiths and Dr. Grigg I was able, in the year 1895, to inspect the records of Queen Charlotte's Lying-in Hospital, and I was greatly struck at the remarkable infrequency of mammary abscess at that institution. Out of 2000 cases examined by myself, taken by selecting 200 at a time, out of different years in the practice of various physicians, to my surprise not a single case of mammary abscess was found. The medical officer was obviously on the alert to note such conditions, for cases of "milk engorgement" with threatening inflammation were here and there noted. It is true that the majority of parturient women were early discharged from the hospital, say in a fortnight or three weeks; but, on the other hand, it must be pointed out that most of the patients were primiparæ, in whom the nipples are often badly developed, badly cared for, and frequently sore. The cause was not far to seek, in the precautions taken by the physicians to ensure the cleanliness of the nipples and of the infant's mouth, and this brings me to enunciate the most important proposition of this chapter, that in the vast majority of cases, acute mammary abscess, whether during lactation or not, and in either sex, is due to absorption by the lymphatics of organisms, which enter abrasions on the nipple or areola. The common organisms found on the skin, can nowhere be more abundant than in the axilla or about the areola of the mamma—parts moist and protected, and affording every opportunity for active increase and growth. Moreover, round the nipple is a fossa kept moist by the secretion of especial sebaceous glands, and in such a locality organisms most abound. The least breach of surface is inoculated as surely, as though the surgeon had rubbed in the virus intentionally.

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[1] *Diseases of the Breast.*

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[1] Holmes's *System of Surgery*, vol. iii. p. 434.

[2] *Manuel de Pathologie et de Clinique Chirurgicales*, tome iv. ; *Maladies du Sein*, p. 686.

[3] *Clinical Memoirs*, pp. 309, 310.

[4] Holmes's *System of Surgery*, vol. iii. p. 435.

[5] *Diseases of the Breast*, p. 25.

[6] *Op. cit.*

Etiology and Predisposing Causes of Acute Mastitis and Abscess.[1]—The frequency of acute inflammation and abscess of the mammary gland is well known, and the cause is not, as a rule, difficult to ascertain.

The breast, from its size and situation, is liable to injuries of all kinds. It is an organ frequently engorged with blood, and containing an animal fluid, forming a convenient nidus for the proliferation of organisms. Through its numerous ducts, access is offered to the entrance of staphylococci or streptococci, in cases of injury to breast tissue, when the ducts are torn. The nipple is frequently sore and cracked in lactating women, at the very time when the lymphatic circulation of the gland is the most active, and hence the entrance of pyogenic organisms takes place readily. The fossa round the nipple, moist and protected, contains the ordinary organisms of the skin—most of which are pyogenic—in abundance. Moreover, the volume and structure of the gland, render it possible that the cellular tissue may be affected by tubercle or syphilis, and especially that products of past inflammations may long lie dormant, to be started into fresh activity by some slight injury. It seems to me certain, that abscess of the breast is invariably caused by the action of organisms, and it is my belief that in the vast majority of cases a crack or abrasion upon the nipple, perhaps readily overlooked, is the usual source of infection. I have on several occasions, in cases of mammary abscess of obscure origin not connected with lactation, been able to demonstrate this condition with a hand-lens, without which aid a small breach of surface may easily pass unrecognised. Acute mastitis may occur from such obscure conditions as mumps or the specific fevers, as typhoid. Abscess may form beneath or near the mamma from necrosis of the chest-wall or spine. The reader must carefully discriminate between actual inflammation and acute engorgement or congestion of the gland, which occurs under a variety of conditions, many of which are physiological, and which, though important predisposing causes of septic processes, are not necessarily associated with them.

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[1] See especially a paper by the author on the causation and treatment of mammary abscess, *Med. Soc. Trans.* 1895-96.

If mere retention of milk could produce inflammation and abscess, surely cases where the nipple is entirely obliterated, and the breast engorged with milk, should be peculiarly liable to these terminations. McClintock[1] relates a case where a young woman, aged nineteen, was confined of her first child, and the nipple and areola of the right breast were entirely obliterated by a large cicatrix, the result of an old burn. She nursed from the left breast, and though the right gland became excessively hard and engorged, it regained its normal size without any trace of inflammatory action showing itself. He relates another case where the nipple and ducts were obliterated by the bursting of a former abscess, and the breast became at another pregnancy greatly distended with milk, but no abscess occurred, though, from suppuration having previously taken place, it might well again have been apprehended.

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[1] *Diseases of Women*, p. 314.

Congestions and Engorgements of the Mammary Gland as Predisposing Causes.—Many of the congestive conditions of the gland are purely physiological, and have been noticed in the first chapter. Among them may be noted the swelling of the breasts of the infant and exudation of milky fluid, the swelling and congestions often observed at puberty, and the notable enlargement and uneasiness of the mammæ in advancing pregnancy. All of these conditions may be readily associated with abscess, if frictions or excessive handling of the parts should allow of any breach of surface and the entrance of organisms. Modern investigations into the true causes of suppuration, exclude engorgements of the mamma as having anything to do with mammary abscess, except as a predisposing cause. In former days the milk was thought to be the cause of most mammary and puerperal affections. Thus, puerperal insanity was termed "mania lactea," and iliac phlebitis was commonly termed "milk-leg." These erroneous terms were first publicly denounced by Meigs, who applied the contemptuous epithet of "milkmen" to his professional opponents!

Milk engorgements are commonly found in cases where suckling is suddenly interrupted, as by the death of the child, or in cases of imperfect development of the nipple, or when the nipple is so sore that the mother cannot bear the application of the child's mouth. In these cases the breast swells enormously, is hot, painful, and congested, while localised knotty, irregular branching areas of induration are plainly to be felt, indicating that the ducts are loaded with milk. The superficial veins are greatly enlarged and prominent. In cases of "sore nipple," when the pain and tenderness are so great that suckling cannot be performed, this state of engorgement is especially apt to arise, and as lymphatic absorption of organisms is so easy and probable in such conditions, abscess is the result. Milk engorgement may thus be looked upon as an important predisposing cause of abscess. Numerous causes may interfere with the flow of the milk, and thus produce congestion of localised lobules or the whole of the mamma. Thus congestions of the milk-ducts may occur from exposure to cold, or an inspissated mass of secretion may block one of the smaller ducts, the milk accumulating behind it; or the death of the child may lead to intense mammary engorgement if artificial aid be not sought.

Engorgement of the mammary glands is common in animals, especially sheep, and there are specimens in the Hunterian Museum of the College of Surgeons to illustrate it. If acute diffuse inflammation supervenes, the affection is a dangerous one, as veterinary authorities well know.

Treatment of Congestions and Milk Engorgements.—The treatment of many of these conditions is conducted on quite simple grounds. It is most essential that any abrasions or signs of local mischief about the nipples should be rendered carefully aseptic, by mercurial washes. Simple evaporating lotions, combined with belladonna, protection of the part, and especially graduated compression with layers of wool or the "Gamgee" tissue, will usually cause the physiological enlargements of puberty to rapidly subside. The child must cease suckling the affected nipple, and the milk must be drawn off by a "pump."

In milk engorgement more active treatment is needful. In the first place, the diet should be restricted in amount, and as little fluid as possible should be taken. Secondly, the bowels should always be acted upon by free saline purgation. Any of the ordinary salts are efficacious in these cases, as the sulphates of soda and magnesia. Should the child not be suckling, small quantities of belladonna or atropine may be given internally, combined with iodide of potassium.[1] The latter drug is of great value in all these affections.

Local measures are of great importance. The milk should be drawn off by an "exhausting pump," and nothing tends to cause subsidence of the swelling and induration like massage. This should be done with the hand of the nurse, the pressure and friction being directed towards the nipple. Warm olive oil, mixed with equal parts of the belladonna liniment, is an excellent and efficacious preparation to apply in this way, and the relief experienced by the patient is usually rapid and striking. The prevention of mammary abscess by expression of milk, and the use of an exhausting bottle to the nipple, is favourably spoken of by Spencer and Beale in the *Lancet* for 7th March 1896. It is especially important that these cases be not-mistaken for abscess. If deep incisions are made to find supposed pus, very free bleeding occurs, and if one of the larger engorged ducts be opened, a milk fistula may remain discharging in a troublesome manner. In delicate women of nervous temperament, the temperature may in simple engorgement readily reach 102° or 103°, and thus the similarity to actual septic processes may be very close and deceptive.

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[1] Sculptors' white clay has been used by Maisel in Russia for cases of acute mastitis. The clay is spread in a thick even layer over calico, with a hole left for the nipple, and is then applied firmly and accurately to the breast. It was changed morning and evening, and proved very efficacious from its great heat-absorbing power. (*Annals of Surgery*, 1888.)

A woman, aged forty, suckling her eleventh child, was admitted under my care into St. George's Hospital on 7th March 1894, for a tumour of the neck causing urgent dyspnœa. This was an accessory thyroid cyst. She had, on admission, ceased to suckle her child, which was eight weeks old. The right breast swelled enormously, became hot, painful, and heavy. It was dusky in colour, marked by enlarged veins, and felt distinctly knotty and indurated at certain spots. At no one locality could fluctuation be detected, and the skin was not distinctly reddened or œdematous, but the enormous increase in size was very striking. Free saline purgation was ordered with "dry" diet, and iodide of potash was administered in full doses. The milk was drawn off night and morning with a breast-pump, but little flowed. Massage was gently carried out daily, with warm olive oil and liniment of belladonna. Under this treatment the considerable swelling of the breast rapidly subsided, and on March 12th a five per cent preparation of oleate of mercury was substituted for the liniment. By March 20th the gland had returned to almost its natural size. The left breast, curiously enough, was but little implicated.

From what has been said, it will be seen that in practice, the vast majority of cases of acute mastitis and abscess are found associated with lactation and cracked nipples, or are the result of traumatism of various kinds. More exceptional causes are tuberculous abscesses, sloughing gummata, suppurating cysts, or breaking-down suppurating areas within new growths, while the formation of matter beneath or within the breast, as the result of necrosis of the chest-walls or spine, is quite exceptional.

Abscess in the breasts of infants has been frequently recorded, and appears to be largely a preventable malady. The milky exudation which flows from the nipples of some infants, is almost entirely due to disintegration of the central cells of the columnar epithelial masses of which the primary gland is formed. When ignorant nurses in these cases pull or rub the nipples a breach of surface is effected by the rupture of a milk-duct or abrasion of the integument of the nipple, and, organisms entering, an abscess is the result. In the well-conducted large "lying-in" hospitals of this city abscess of the breast in infants is practically unknown, yet the swelling and hyperæmia associated with secretion of spurious milk are not uncommon, and often lead to feelings of alarm in the mind of the medical attendant. These cases are now very exceptional.

A case of mammary abscess in an infant three weeks old is related by Dr. Stephen of Lettercairn.[1] It is said to have been caused by "retention of milk." The child, a female, was sixteen days old when the right breast inflamed, pointed, and was opened; about an ounce of thick greenish pus escaped. On examination a milky secretion was found issuing from the left breast, which was examined with the microscope and found to resemble the maternal milk except that the latter contained more corpuscles. Similarly a case of double mammary abscess in a male infant is related by Dr. Wilks of Ryde.[2]

Attention being drawn to the subject, quite a number of cases of abscess in infants are recorded by various practitioners.[3] Most observers refer the occurrence of the abscess to the practice prevalent among ignorant nurses of pulling and rubbing the nipples. Dr. Robert Barnes[4] supports this assertion, and states that when he was house-surgeon to a lying-in hospital, he encountered several cases of abscess in the breasts of infants due to the manipulations of nurses. Numerous other instances may be found in surgical literature where experienced practitioners attribute cases of abscess in infants to this practice.

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[1] *Brit. Med. Journ.* 25th July 1874.

[2] *Ibid.* 1st August 1874.

[3] *Ibid.* 8th August 1874.

[4] *Ibid.* 15th August 1874.

In cases of swelling and engorgements in the breasts of infants, were the attendant content to keep the parts about the nipple scrupulously clean with a very dilute mercurial wash, and to apply graduated pressure with cotton-wool and bandage, the phenomena of abscess would probably never occur. Abscess in the neighbourhood of the breast in babes, is sometimes due to lymphatic suppuration from a foul and septic umbilicus. I have seen three cases of this nature. The abscesses were really peri-mammary, and I suspect that this cause of suppuration about the pectoral region of infants is sometimes overlooked, or mistaken for abscess of the gland itself.

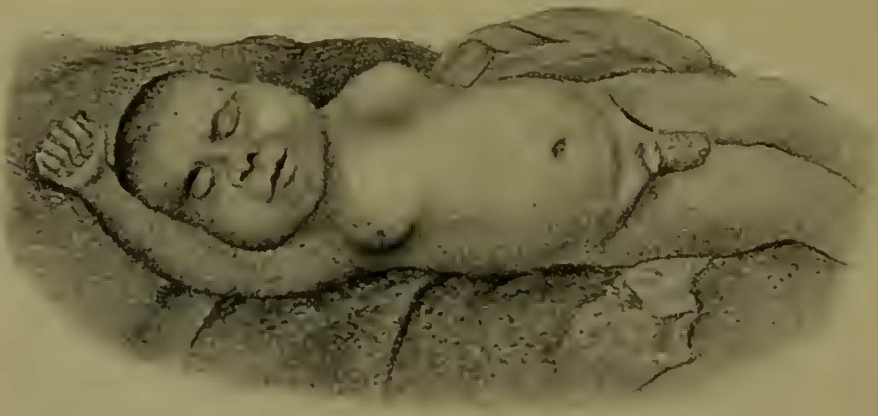

FIG. 12.—Mastitis and milk secretion in an infant.

Pathology.—The pathology of mammary abscess is largely covered by the consideration of its causation. The opinion has already been expressed, that the frequency of abscess of the breast, is entirely due to the ease with which pus-producing organisms can find entrance to collections of milk, congestive exudations, or extravasated blood, in a warm and vascular gland, conditions most conducive to their spread and rapid proliferation. I have also expressed the belief that in the majority of cases of acute breast abscess, minute abrasions are to be found in the nipple, by the aid of a lens, through which the organisms gain access. The pus which flows from an acute mammary abscess is usually thick, yellow, and creamy, the "laudable" pus of the older authors. I have had the pus examined bacteriologically in eight cases of mammary abscess. Four of these examinations were carried out by the bacteriologist of St. George's Hospital, Dr. Slater. In all of the eight cases the staphylococcus aureus was the organism found.

There is no reason in exceptional cases why streptococci, or the bacillus septicus, should not enter, and this explains rare cases of mammary suppuration which prove fatal through sepsis. The walls of mammary abscesses are formed of congested tissue and granulations. In more chronic abscesses, there may be a distinct lining membrane with great thickening and condensation of the surrounding tissues, so that solid growths are exactly simulated. In tuberculous abscess, the usual characters of thin watery pus mixed with caseating material, and ragged irregular walls, are found. Frequently, other caseating deposits are scattered through the breasts, and the adjacent lymphatic glands are usually enlarged and stuffed with caseating products, or softening and tending to form abscess.

Suppurating hæmatoma is generally marked pathologically by the presence of blood-clots in the discharge, and such a rarity as a suppurating hydatid cyst, by shrivelled secondary cysts, or disintegrating fragments of the ectocyst. Suppuration occurring in the cysts of morbid growths, as cancer or sarcoma, is exceptional, but must be recollected. In pyæmic abscess, some source of sepsis will be present, as a neglected septic abortion, or an adjacent foul cancerous ulcer. I have known such abscesses to be found for the first time on the post-mortem table in cases of general pyæmia, when the soft parts were being reflected from the thoracic walls. They doubtless are often overlooked.

There will be found in pyæmic cases intense inflammatory infiltration of the breast about the abscess, and probably an erysipelatous blush on the skin.

The cases, says Spiegelberg, in which abscess of the mamma is part of general septic infection must be very few. Rokitansky mentions the occurrence, and other cases are related by McClintock and one by Spiegelberg[1] himself. McClintock's case of abscess due to general septic infection is referred to in his clinical memoir on diseases of women (page 325): "Only one example has fallen under my notice in which I felt satisfied the abscess of the breast was purely symptomatic. In this instance it succeeded to uterine phlebitis. An enormous swelling, attended with great pain and some discoloration of the skin, formed in the superior part of the right mamma, extending upwards to near the clavicle. On dissection, an immense quantity of unhealthy purulent fluid was infiltrated throughout all the tissues, and the case proved fatal."

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[1] *Text-book of Midwifery*, vol. ii. p. 408.

Situation.—Some authors have stated that abscess is most common in the lower lobes of the breast, and this was the opinion of Nunn and of Birkett. Much time has also been expended in investigations as to which breast is the more commonly affected, which serves little useful purpose. It is far more important to consider where the purulent collections are apt to form as regards depth. In a considerable number of cases the matters collect superficially beneath the skin (supramammary abscess; "abscès de l'areole"). The termination is by sloughing and ulceration of the integument at one or more points. The breast tissue is not implicated seriously, but the destruction of integument is especially to be feared. Still more superficial suppuration may be found of the nature of common boils. Such processes are apt to originate in the tiny sebaceous glands on the areola. When pus forms deeply within the breast substance (intramammary abscess), much destruction and subsequent deformity of the gland may arise. The pus may burrow extensively, forming irregular cavities, and when it finds its way through the skin, intractable sinuses result.

In the breast it especially happens that abscesses are prone to become constricted at one part, where the pus has burrowed through fascia or intramammary septa. The abscess then assumes a shape which may well be likened to an hourglass. This most important variety of mammary abscess is too little noticed in modern times, but was long ago well described by Velpeau under the term "abscès en bouton de chemise." I have seen several examples of it. The abscess shows itself as a considerable subcutaneous swelling, and if the usual practice is adopted of making an incision radiating from the nipple the discharge will continue indefinitely; the true explanation being due to the fact, that the main bulk of the pus is found deep in the substance of the gland, communicating with the collection found under the skin of the areola by a narrow and sometimes sinuous channel of considerable length. I shall refer to this variety of abscess again when speaking of the subject of treatment, and meanwhile I may only point out that the likeness of the shape of the abscess to a shirt-button, as stated by the French writers, is peculiarly appropriate.

The formation of pus really beneath the breast (submammary abscess) is in my knowledge quite an exceptional affection. This is well exemplified by the experience of the St. George's cases quoted at the commencement of the chapter. Any one who has large experience of mammary abscess will bear me out in saying that they rarely see a case of this variety, so prominently mentioned by many writers. A chronic submammary abscess will probably be associated with necrosis of a rib, or a tubercular deposit, or possibly with a pointing empyema. It may also be the result of a heavy blow with great extravasation of blood.

Suppurative Affections of the Ducts themselves.—Attention is drawn by some writers to a form of mammary abscess where the milk-ducts are primarily affected, and where the abscess is consequently of a branched or irregular form. I think there are considerable doubts whether in all these cases the true origin of the mischief is not in some slight abrasion of the nipple, the suppuration being really "lymphatic" in origin. In a gland like the breast a deep abscess is very apt to burrow irregularly among the fibrous septa and through the gland tissue, and the temptation to regard this as evidence of its origin in affected milk-ducts becomes very great. Cases where pus flows with the milk (galactophoritis) should rather be looked upon as purulent inflammation of the ducts, than placed in the category of abscess. Velpeau and several French authors, insist upon the division of mammary abscess into the two great classes of parenchymatous, and suppurations in the milk-ducts, and the distinction seems more sharply drawn by

French authors, than by writers on this side of the Channel. The question of whether the abscess has originated by purulent catarrh of a milk-duct or not, cannot be settled by the finding of pus-producing organisms in the milk, since these might readily find their way into the ducts accidentally; and recent investigations go far to show that pyogenic organisms may be normally present in the larger milk-ducts, causing no disturbance so long as the walls of the ducts are intact.

Boissard, in a clinical lecture delivered in Paris,[1] speaks very positively of the invasion of the milk-ducts by streptococci and staphylococci, and terms the affection Galactophoritis. Chassaignac described the disease under the name of Canalicular intero-mammary abscess. Boissard, however, doubts that suppurative affections of the milk-ducts themselves can occur without a breach of surface, however small and insignificant this may be.[2] Galactophoritis is characterised by the escape of pus into the milk when pressure is applied to the breast. This affection is insidious, and is a grave one for the child, who loses weight rapidly. Atrophy and marasmus of a suckling infant, should always lead to a careful examination of the milk with the microscope. Boissard lays great stress upon the fatality of this affection among infants, and a careful consideration of it may be recommended to those who study children's diseases.[3]

Wyeth relates in the *New York Med. Journ.* for 1890 a case where a non-lactating woman, aged forty-two, was affected with multiple mammary abscesses, burrowing through and destroying the whole gland. He terms the case "Infection of the mammary gland through the nipple and galactophorous ducts." First the left breast was affected, then the right. The destruction was so severe that amputation of both glands was performed, which seems to have been a rather severe remedy.

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[1] *Medical Week*, 1893, p. 499.

[2] In 1894 Prof. Sherrington and myself performed two experiments which had a negative result. Into the nipples of a lactating cat and rabbit pus was well rubbed, the teats being first emptied by expression. The pus was from a tuberculous abscess in one case, and from a pyæmic abscess in the other. In neither did any bad results follow. The experiments were thoroughly carried out.

[3] An excellent account of organisms in human milk and their deleterious influence upon the child, will be found in a work by Dr. Edmund Cautley on the feeding of infants. A case is there referred to by Maygier (105) where a child died on being suckled by a breast affected with lymphangitis. Post-mortem, pus was found in its digestive system.

Dr. R. A. Gibbons of London, in relating a case of acute purpura hæmorrhagica in a child,[1] refers to a striking instance of the pernicious effects of pus in milk upon a weakly boy exhausted by diarrhœa. A little boy, aged three years, was long under treatment for chronic enteritis. He was ordered among other details of treatment ass's milk, and progressed well, until he was smitten with a sudden and unexplained recurrence of the symptoms, while residing near the sea-side. On examination it was also found that he was suffering from severe purpura with epistaxis and melæna. He subsequently vomited pure blood and died exhausted. He was under treatment only thirty-six hours for the purpuric symptoms, and the following important particulars were elicited from the mother about his previous state. "I was told," writes Dr. Gibbons, "that one morning, about six days previous to his death, the mother on pouring out the milk from a jug into a basin, noticed a thick sediment at the bottom of the vessel, which she declared looked like ordinary matter. On inquiry, her husband ascertained from the man who looked after the donkey (which had been bought especially for the little patient) that there was an abscess of the udder which had existed for some time."

Velpeau asserts that tuberculous cavities in the lung may communicate with mammary abscesses, and cause them by the disease infiltrating the chest-wall. The contents of such abscesses are gaseous and exceedingly fœtid. He noted one case where the odour was so offensive the pupils had to leave the bed-side. He criticises Forget for stating that these abscesses are rare, and states that he has often met with them.[2]

I cannot help thinking that such cases are probably empyemata containing foul gas and pus pointing beneath or about the mamma, or possibly abscess in connection with the stomach or intestine burrowing through the diaphragm. A case related by Martin[3] where an apparent mammary abscess in a child aged one year discharged itself by the air-passages with violent coughing, was almost certainly an empyema. Dr. Mitchell Bruce has informed me, that he has never met with a case of pulmonary tuberculosis infiltrating the chest-wall and breast, and Wilson Fox in his elaborate work does not mention this condition. This is a sufficient proof that such a condition, as maintained by Forget, must be rare and exceptional. In connection with the gaseous abscess, mention must be made of the "diffuse phlegmon" of the breast noted by the older writers when the tissues became gangrenous and the patient rapidly sank.

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[1] *Med. Times and Gazette*, 3rd January 1885.

[2] Velpeau, *Diseases of the Breast*, p. 116.

[3] *Med. Press and Circ.* 16th March 1890.

Glycosuria may be present in abscess of the breasts. This phenomenon, spoken of by Verneuil, has been little noted by English authors, though it is known that sugar is sometimes found in the urine of lactating women. Glycosuria is certainly not an invariable accompaniment of mammary abscess. There was not a trace of sugar in the urine of six consecutive cases of great severity examined by myself. In very severe instances of mammary abscess, which burrow extensively and are associated with sloughing, especially if they arise spontaneously, the presence of glycosuria may be suspected and ascertained.

Symptoms and Diagnosis.—The symptoms of acute mastitis and mammary abscess are typically those of acute inflammatory affections generally. In addition to the local signs of redness, heat, and swelling, the patients complain of severe throbbing pain, of thirst, and fever. The pulse is hard and quick, the tongue foul, and the temperature may be considerably raised. I would especially warn the practitioner against placing too much reliance upon the temperature as an evidence of formation of pus. As has been pointed out, a considerable elevation is familiar in simple engorgement of the breasts with milk, and I have known slight "chills" or rigors to occur in congestive conditions where no pus has formed. The most reliable symptom of acute mammary abscess is distinct fluctuation. In the superficial subcutaneous abscess this is readily to be detected. In the intramammary abscess nothing is more difficult than to certainly pronounce upon the presence or absence of pus. Too often the inflamed breast is insufficiently exposed, or through some little roughness on the part of the examiner the patient shrinks from proper examination. An "exploratory" puncture with a lancet, or bistoury, is then often made, with or without nitrous oxide gas; nothing flows but blood, the patient is alarmed, and great disappointment and complaints are apt to arise.

The proper manner to examine for abscess is as follows:— The part being well exposed, the patient lies upon a couch, and the surgeon noting the most prominent, red, and shining part of the suspected swelling, feels there for fluctuation, or a sense of deep elasticity, with the pulps of the two forefingers laid flatly and evenly upon the part. The utmost gentleness should be observed. If œdema of the integuments at the points of pressure be found, this is an additional symptom of the presence of pus. In contradiction of the teachings and of the writings of many, I would strongly urge that no incision be made until a sensation of elasticity combined with deep fluctuation be plainly detected. In bad cases a careful daily examination should be made. On the other hand, the surgeon should never delay until the pus has burrowed under the skin, and worked havoc and ruin in the mammary structure. Indeed, the exact time to make an incision in a case of mammary abscess, is often a question of no little difficulty to decide. The inexperienced surgeon will probably do less harm by waiting for definite fluctuation, than by making "exploratory incisions" through inflamed and vascular tissues.

It may be thought that the ordinary diagnostic symptoms of acute mammary inflammation and abscess are so evident, that mistake would be out of the question. On some exceptional occasions, a diagnostic difficulty arises in these cases which is of very grave import, namely, the confusion between abscess and acutely inflamed, rapidly growing carcinoma or sarcoma. This is especially likely to occur if the growth be breaking down in the centre, or if it be of the nature of an inflamed carcinomatous cyst. Precisely the same diagnostic difficulties, are found in suppuration in connection with carcinomatous glands of the neck, or suppurating epitheliomatous cysts in this locality. If an incision is made in this type of case, blood and broken-down debris escape, but seldom any pus. Fungation follows, with its attendant drain of bleeding and discharge, and the termination of such a case where the diagnosis of abscess has been confidently given, may be very disastrous to the reputation of the surgeon who has committed the error.[1]

In March 1896, my colleague, Mr. Dent, was kind enough to allow me to see with him a pale, emaciated, wan-looking sempstress aged thirty-seven. She had borne a painful increasing swelling in the right breast for three months. There was no apparent cause. The nipple was healthy, the axillary glands were not affected. It is no exaggeration to say that all the symptoms of abscess were evident in this case. There was redness, heat, pain, and distinct fluctuation. There were, however, two symptoms which raised suspicions that the case might not be quite so simple. The skin seemed thickened and bore the appearance of "peau d'orange," and there seemed more solidity round the base of the swelling than is usual in abscess. An incision revealed a soft tumour, with the centre breaking down into a cavity full of blood and serum, and the whole breast was consequently removed. The growth was soft carcinoma.

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[1] See especially a most interesting series of cases of malignant disease simulating abscess by Marsh in vol. xxiii. of *St. Bartholomew's Hospital Reports.*

This all-important subject will be again alluded to, in speaking of the diagnosis of carcinomatous cysts of the breast, which, when inflamed, simulate abscess in a most remarkable manner. The same diagnostic difficulties between abscess and inflamed carcinomatous or sarcomatous growths arise in other parts adjacent to the mamma. Thus, in 1893, the late Mr. Durham saw with me a swelling in the thoracic wall of a gentleman of advanced age, which was apparently an abscess. This was the opinion of Mr. Durham, and the swelling was to have been opened. On after-consideration he again saw the case, and then believed it to be an instance of inflamed malignant growth, and advised me most strongly to merely puncture the swelling as a diagnostic measure. Ultimately, the "tumour" was opened by another hospital surgeon, and it was a simple abscess with thick walls. I mention this to show the doubts that may occur in this class of cases, even in the mind of so experienced an operator as the late senior surgeon of Guy's Hospital.

The symptoms and diagnosis of chronic mammary abscess have long been notorious for their uncertainty. There are probably few surgical disorders which have been associated with more deplorable errors. This subject will be so frequently alluded to in speaking of the diagnosis of deeply-seated cysts and tumours, that too much space must not be occupied by it here. The causation of many of these cases is quite obscure. They are surrounded by a dense mass of fibroid material, and may possibly have their origin in a past blow, or the residue of a former abscess, or the inspissated remains of a collection of milk in an obstructed duct. It is a striking fact, that many chronic abscesses of the breast of slow and insidious formation, and of dubious causation, are found in the sterile or single woman, as well as in those who are suckling or have borne children.

Any one who wishes to study an interesting series of chronic abscesses of the breast simulating malignant disease, may peruse the article of Reclus upon this subject in the *Cliniques Chirurgicales*, 1888, p. 417. The same matter is dealt with at length by Castex, Chef de cliniques de l'Hôtel Dieu, in the *Revue de Chirurgie*, 1887.

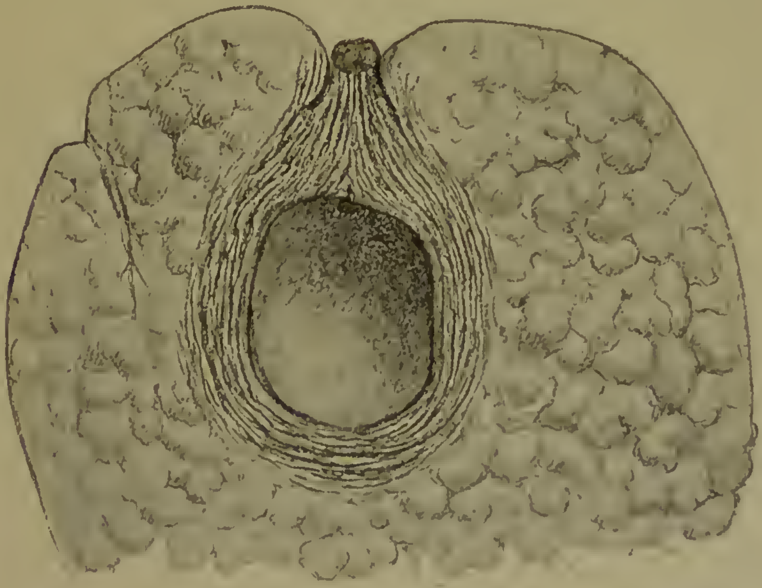

FIG. 13.—Chronic mammary abscess with retraction of nipple and a puckered sinus, simulating the dimple over a carcinoma. The mamma was removed in mistake for carcinoma.[1]

The reader will do well to bear in mind :—

(1) That fluctuation may be quite absent in deeply-seated chronic abscess, and local heat or general fever may be wanting.

(2) That the leading signs of such deceptive accumula-

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[1] This figure is of importance in connection with the subject of the diagnosis of mammary cancer.

tions of pus are mainly as follows: (*a*) There is often a soreness or abrasion of the nipple to be found on careful inspection. (*b*) Firm pressure with the pulp of the index-finger upon the centre of the swelling usually gives a sensation of yielding or elasticity; when the finger is removed slight œdema may be observed. Pain of a throbbing nature is not uncommon. (*c*) Exploratory incision is the only certain diagnostic means of discovering a chronic abscess of the breast when deeply seated.

Chronic Tuberculous Abscess—Cold Abscess.—Cold abscesses in connection with tuberculosis are exceedingly important, and receive but scant notice in many of our text-books. The affection did not escape the observant eye of Sir Astley Cooper. "In young women, who have enlargement of the cervical absorbent glands, I have sometimes, though rarely, seen tumours of a scrofulous nature form in their bosoms, confined in most cases to a single tumour in one breast; but in one case, two existed in one breast, one in the other." In delicate women of the tuberculous diathesis one or more swellings may form in the breast, sometimes after a blow, often without obvious cause. The swellings are slightly tender, and very indolent in progress. As they increase in size they slowly soften, the skin becomes discoloured over them, and finally gives way with a discharge of this watery or curdy pus. The pectoral and axillary glands are apt to share in the mischief, becoming enlarged and slowly suppurating. The tubercle bacillus may be detected in the discharge, but this is by no means to be looked upon as a certain diagnostic guide. Though generally found in young women who have fair skin and blue eyes, with glandular scars in the neck, lung mischief, or a marked tendency to pulmonary tuberculosis, it will be remembered that tuberculous disease of the breast is also exceptionally found in elderly women and may simulate other diseases. An extensive bibliographical list of tuberculous disease of the breast is given by Shattock in the *Lancet* of 8th June 1889, and in the *Transactions of the Pathological Society* for the same year, which comprises most, if not all, of what has been written regarding the subject up to that date.

Charles A. Powers, M.D.,[1] reports a case operated upon by

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[1] *Annals of Surgery*, vol. xx. 1894.

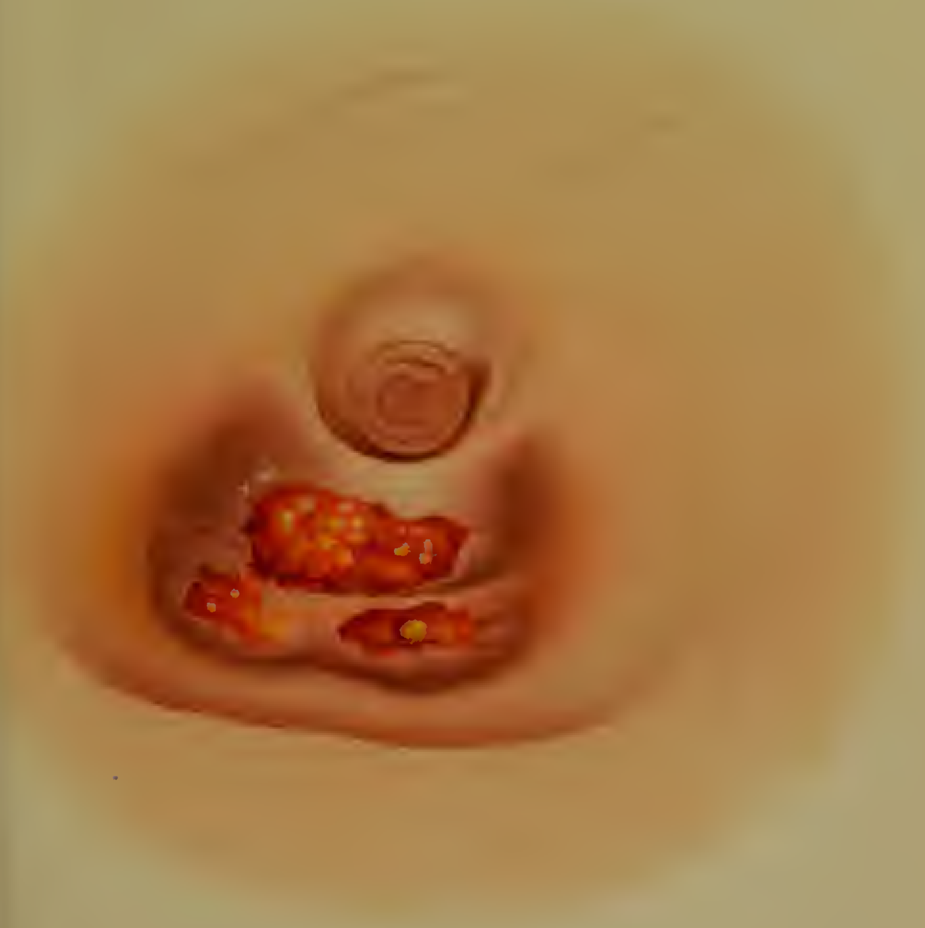

PLATE II.

Tuberculous abscess of mamma with extensive destruction of the skin.

page 68.

Bull in 1886. The author finds authentic records of 35 cases. Of these 34 were in females, 1 in a male. Of the 34 women, 22 were married, 5 single. In 8 the civic condition was not mentioned. Of the 22 women 21 had borne children, and 6 had actual suppurative inflammation of the breast, while 3 had had an inflammation not going on to suppuration.

In 18 the right breast was affected, in 14 the left. In 1 both glands were involved, and in 2 the side was not stated. The youngest patient was seventeen years, the oldest fifty-two; 4 were under twenty, 11 between twenty-one and thirty, 9 between thirty-one and forty, 10 between forty-one and fifty, 1 over fifty.

Evidently the puerperal state and lactation are predisposing causes. The appearance of the disease is, however, evenly distributed through the third, fourth, and fifth decades of life.

Of the 35 collected cases 2 died of general tuberculosis, the breast affection being discovered only at the autopsy.

Of the remaining 33 but 2 cases were traced after operation, these dying of phthisis in one and four years respectively.

Actinomycosis.—Actinomycosis of the breast is a rare affection. It is very possible that some obstinate cases of mammary suppuration, with burrowing sinuses, may really have been of this nature. The treatment would be the free use of the sharp spoon, with the administration of full doses of iodides.

A case of actinomycosis of the breast and lung associated with tubercle is reported.[1] At the necropsy the right lung and thoracic parietes were incorporated, and had to be removed *en masse.* One of the sinuses from the mamma perforated a rib. In addition to numerous tubercles, actinomyces were found in the breaking-down lung, and in a soft purulent mass in the right lobe of the liver. This unusual combination is on the authority of Mr. Beadles, the resident surgeon at the Cancer Hospital. The main points in the case during life were the obstinate nature of numerous sinuses which formed in the breast. The liver was enlarged and great tenderness was noted over the parietes. The similarity of this case to some related by Velpeau and thought to be tuberculous is very striking.

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[1] *Brit. Med. Journ.* 18th July 1891

Jamain and Terrier mention an instance of this affection occurring in a woman aged thirty-two. It was associated with troublesome fistulous sinuses, the thoracic walls and lung being permeated with fistulous tracks and abscesses.[1] The following cases are also of interest.

(1) A nodule appeared in the unused breast of a woman, aged thirty-five, towards the end of lactation and after a blow. This was subsequently incised and pus let out. The wound healed in two months. Later the breast became hard, and eventually a sinus formed. On admission the patient looked well. There was a tumour in the breast about the size of a hen's egg, but no enlargement of glands. The sinus led into a cavity containing the characteristic sulphur-coloured granules. The whole breast was removed. The underlying pectoral muscle was healthy. The fungus was also found in sections from the breast tissue. (2) A girl, aged twenty-five, had pain, and some months later a tumour in the breast after a blow. This was incised. The wound soon healed, but six weeks later another tumour appeared. On admission the outer half of the left breast was very hard, with a sinus in it. The diagnosis lay between chronic mastitis with abscess, and tuberculosis. The diseased tissue was excised, and sections prepared some months later revealed the ray fungus. Both patients were cured. The author found about the carious teeth of the first patient a fungus resembling in many respects the actinomyces. In the second .case the origin was, if anything, even more obscure. In both cases there was a blow on the breast, an incision, and the application of linseed-meal poultices. The second patient had a cough but had no signs of pulmonary disease. The author then refers to a case of mammary actinomycosis recently recorded, in which the patient worked in the harvest fields with almost uncovered breasts.[2]

The various kinds of acute mastitis and abscess of the mamma are so many and diverse that a number of cases will be related bearing upon what has been said, and illustrating various points in diagnosis and treatment.

Mastitis of Mumps.—When taking charge of the practice of the late Dr. Easton of Hyde Park Crescent, in the autumn of 1884, I observed and took notes of some remarkable cases of this nature. Two young children of a family had mumps. There was nothing peculiar about their illness, which was severe enough, with great parotid swellings and some fever. The disease was very prevalent in the locality, many cases coming under my notice. The eldest girl, aged fourteen, was at school in the neighbourhood, and I was sent for to see her on account of a sudden, painful, intense inflammation of the right breast. In two days the opposite breast became in like manner affected. The girl was very ill with high fever, and all the local signs of intense inflammation were marked. At one time suppuration seemed imminent, and the question of puncture was discussed. She was removed home and none of the other inmates of the school were affected. I afterwards found that she had visited the children and played with them during the height of their attack. About ten days after this, the nurse, a young woman of twenty-four, was seized with intense inflammation of the right mamma, which was painful and swollen for a full week. It then rapidly subsided. No treatment beyond evaporating lotions and mercurial purgation was adopted in either of these cases, though the question of puncture was considered. So far as I know, the acute mastitis of mumps never suppurates.

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[1] *Manuel de Path. et de Clin. Chirurg.* 1892.

[2] Müller, quoted in *Brit. Med. Journ.* 19th January 1895, epitome, p. 10. N. Senn, on p. 555 of his *Principles of Surgery*, relates an instance where actinomycosis attacked the scar left after excision of the male mamma.

Acute and subacute inflammations of the mammæ may as a rarity appear as sequelæ of other specific fevers besides mumps.

Thus a woman, aged forty, was in University College Hospital with a painful swelling of the right mamma which had existed for a fortnight. Three days before admission the left breast also became inflamed. She had typhoid fever two months previously.[1]

Although, as has been pointed out, the staphylococcus aureus seems to be the common organism in breast suppuration, there is nothing to prevent more virulent bacteria from entering. This may perhaps explain those fatal cases of mammary inflammation which are spoken of by the earlier writers, but which I myself have never seen. They are termed Diffuse Phlegmon of the breast, and are analogous to gangrenous cellulitis occurring elsewhere. The rapid decomposition and gaseous infiltration observed in some of these cases make one suspect the entrance of the bacillus septicus. The cases are hardly touched upon by modern writers. Not one instance occurred at St. George's Hospital between 1865 and 1895.

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[1] *Univ. Coll. Hosp. Reports* for 1888, p. 75.

One of the most remarkable cases of gangrene of the breasts on record will be found related by Robinson.[1] The subject was a dissolute and syphilitic prostitute, who had suffered from various kinds of venereal disorders. Both mammæ became gangrenous and entirely sloughed away, leaving open granulating wounds. The left foot and breast became gangrenous also, and underwent spontaneous amputation. Symptoms of gangrene also appeared in the digits of the right limb. A large abscess burst on the left side. She died, but no post-mortem was done, and unfortunately the condition of the vessels was not noted. One could surmise that vascular syphilitic changes of great extent existed.

Velpeau notices the case of a healthy and powerful young woman, who was neither pregnant nor recently confined, who was attacked with what was considered to be "erysipelas" near the left nipple. The swelling increased with a rapidity similar to that observed in the scrotum, eyelids, or cellular tissue elsewhere. A large gangrenous patch formed over the external half of the gland, and the patient rapidly sank. In such a case modern investigation would probably have discovered such organisms as streptococci and the bacillus septicus.

In the museum of the Royal Infirmary of Edinburgh (1891 b) there is a specimen of this nature, referred to in the Catalogue as acute inflammation of the mamma terminating in sloughing shortly after parturition, in a woman aged thirty-five.

Birkett also quotes two marked examples from the practice of Parisian surgeons.[2]

Clinically, "diffuse phlegmon" is characterised by enormous swelling of the mamma, the skin becoming of a livid hue, and finally black and discoloured in patches. Free incisions give vent to foul sloughs and broken-down tissue. The constitutional symptoms are at first fever of a high type, with delirium, followed by exhaustion and a tendency to coma. The affection is comparable to the worst kinds of cellulo-cutaneous inflammations observed in the limbs, and its pathology is probably similar,—the entrance of virulent organisms (streptococcus and staphylococcus or bacillus septicus (?)) into tissues the normal resistance of which is lowered by renal disease, alcoholism, bad living and hygienic surroundings.

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[1] *Med. Times and Gazette*, 1864, ii. 261.

[2] *Diseases of the Breast*, p. 43.

Mammary Abscess combined with Mania.[1]—A young woman, aged twenty, was confined nine days before admission. The nipple got sore and an abscess quickly formed. The abscess had broken in two places and the patient was maniacal. The sinuses were laid into one and antiseptic dressings applied. Another small abscess formed and had to be opened. The temperature continued high, reaching to 105°. Antipyrin and cold sponging was resorted to. The patient was also placed under gas and all the sinuses freely laid open, but the temperature only subsided with the recovery from the mania, and the high fever was noted not to be due to any "pent-up discharge." She was sent out on the eighteenth day convalescent and seemed quite rational.

In ordinary practice the combination of mammary abscess with acute mania is rare. The above is the only case I have been able to find, and personally I have only once seen this condition. Cases of puerperal mania are usually treated in asylums, and physicians who especially deal with insanity are quite familiar with mammary abscesses, which are caused by the patients knocking themselves about. Thus, at a meeting of the Medical Society of London on 27th April 1896, an undoubted authority, Sir James Crichton Browne, in a discussion on a paper read by myself on mammary abscess, alluded to the comparative frequency of this affection in patients with puerperal mania, probably excited by self-inflicted blows and other injuries.

Obstinate Sinuses in the Breast.—A large number of cases will come before the notice of the surgeon where sinuses in the breast exist, the result of spontaneous opening of mammary abscess, or of inefficient incisions for the evacuation of the pus. Some of these are peculiarly troublesome, and the breast may be quite riddled with circuitous cavities and passages, the patients being pale, anæmic, and exhausted. Examples are usually met with among the poor, when the abscesses are neglected, or opened with mere punctures, and the pus allowed to burrow unchecked.

In the majority of cases, if these sinuses are scraped, the unhealthy skin cut away from their orifices, and their recesses well flushed out with perchloride lotion (1 in 1000), they will soon heal. The sinuses may also be stuffed with iodoform gauze, and it is especially important that pressure should be exercised with a "breast-bandage" and the arm kept at rest by the side.

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[1] *Univ. Coll. Hosp. Reports*, 1885, p. 76.

Iodine lotion, weak solutions of perchloride of iron, "liquor calcis chloridi," and the "lotio rubra," are all good applications to mammary sinuses. These agents should be injected by means of a syringe with a long and fine nozzle, to the extreme depths of the sinuses.

The sinuses should always be laid open as far as circumstances will permit, and the general health of the patient must receive careful attention. The internal administration of iron and quinine, with good diet and wine, are very advisable. Above all, residence in the sea air of the East coast, will not uncommonly cause even desperate cases of mammary sinus to heal, especially if combined with careful local dressing.[1]

Among those whose circumstances are poor, much of this essential treatment cannot be carried out. So desperate are some cases of mammary sinus that amputation has been resorted to, but this should always be avoided if possible. It has been hinted that some of these inveterate cases have been really instances of actinomycosis, an affection which is easily overlooked. The complete rest of the arm should especially be insisted upon.

Sinuses in Breast necessitating Amputation.[2]—A married woman, aged forty-four, had five healthy living children and then six miscarriages. Beyond this, there was no suspicion of syphilis, and there were no symptoms of phthisis. She had never suckled with the left breast, which was small, lumpy, and painful. The gland had been painful for eight weeks and discharged from near the nipple, which was retracted for three weeks. The upper and inner part from the third cartilage to the xiphoid was firm, very tender, lobulated, and adherent to the pectoral. The skin was adherent over low, rounded prominences of a red colour. Three sinuses near the nipple discharged thin yellow fluid from a superficial abscess. The liver and spleen were enlarged, smooth not tender. Menstruation was normal, and the evening temperature often over 99°. The sinuses quite riddled the breast, which was finally amputated under antiseptics, and the wound speedily healed. The gland was indurated, traversed by sinuses with granulating walls, leading to a sloughy cavity beneath the breast. The ducts were full of soft caseating material.

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[1] I have found the air of Ramsgate peculiarly beneficial in chronic suppurative affections of this and a similar nature.

[2] *Univ. Coll. Hosp. Reports*, 1881.

Similar cases are as follows:—

A feeble, anæmic woman, aged thirty-two, who had until recently been suckling her two years old child, was admitted into St. George's Hospital on 22nd October 1895. About three months ago she got a small abscess on the inner side of the left thigh, which discharged and spontaneously healed. The right breast had "gathered" for six or seven months. "Hard lumps" had formed in the breast, and these had repeatedly broken and had been treated by poultices. On admission, the skin over the right breast was extensively destroyed, three large ragged ulcers being present, and the bases of the sores were covered by foul granulations. The edges of the ulcers were undermined and livid in colour. On the 8th November, as little improvement or healing seemed to be taking place, the whole gland was amputated, and rapid union occurred. On examination several abscess cavities were found in the breast; there was no evidence of tubercle. The mammary substance was indurated and fibrotic.

A married woman, ætat. twenty-two, was under my colleague Mr. Dent's care in October 1895. She had two children, the youngest being two and a half years old. About three months before admission she had a "red spot" on the inner side of the left thigh, which enlarged and suppurated, and a sore formed, which soon healed. The right breast had been hard and painful (gathering) for six or seven months. A month ago the breast was poulticed and two abscesses formed and burst. The breast was enlarged and hard, especially at the lower part. The nipple was not retracted or the axillary glands affected. There were three ragged ulcers with livid undermined edges below the nipple. The edges of the sores were soft, the granulations poor in formation, and a thin sanious pus escaped. There was no family or any history of tubercle or of syphilis.

As the breast was small and considerable damage was done to the skin over it, the whole gland was removed. Examination showed to the naked eye a depressed cavity lined by granulations with undermined edges; the breast substance beneath was infiltrated with inflammatory products, but there was no distinct evidence of tubercle.

Sinus of Breast close to Nipple persisting in spite of Remedies, and cured by freely laying open the Branches of the Sinus.—A delicate-looking young woman aged twenty-six, who had lost many relatives from phthisis, saw me in April 1896, on account of a persistent sinus near the left nipple. Two years ago an abscess had formed there after a blow, and this had been opened with a "lancet" puncture. Ever since the sinus had discharged. It would heal and then break out again. This repeatedly happened while the case was under my observation.

On 9th April Mr. Collard, then acting as assistant house-surgeon, laid the sinus open under my directions. It was far more extensive than was at first thought, passing under the base of the nipple, and from thence at right angles into the mammary tissue, where was a cavity lined by pyogenic membrane the size of a small walnut. The incision was carried up to the nipple, and then again onwards from its opposite side, leaving the nipple intact. The sinuses were well scraped, painted with a solution of chloride of zinc (1 in 10), and stuffed with iodoform gauze. Healing, tardy at first, was ultimately quite sound and complete.

In cases of deeply-seated and inveterate sinuses, a wedge-shaped portion of the breast may be excised with good result. I have several times performed this operation. A probe should be passed into the centre of the sinus or cavity, and the breast tissue around cut away. The base of the wedge should be towards the periphery of the mamma. The opposite surfaces should be united by deep and superficial sutures of catgut, and drainage carefully carried out. Before operating, the sinuses should be most carefully scraped and rendered aseptic by pure carbolic acid or flushing with solutions of 1 in 1000 perchloride of mercury.

Multiple Mammary Sinuses treated by Excision of a Portion of the Breast.—A woman, aged fifty-eight, was admitted into St. George's Hospital on 15th April 1891. Twelve months before she had noticed a "gathering" in the right breast, which broke and discharged. On examination the nipple was found to be retracted, and there was a discharging sinus at the outer part of the right breast. On cutting down upon the sinus, it was found to lead into a smooth-walled cavity, and another cavity on the inner side of the nipple communicated with it as well. There was no suspicious induration found. Mr. W. H. Bennett, who operated, removed the affected portion of the breast containing the sinus and cavities, and rapid healing supervened. I saw this case two years after, and the ultimate result was excellent.

A similar instance is as follows:—

An emaciated, feeble-looking woman was admitted into St. George's Hospital in September 1896, under my care, for a sloughing abscess of the left breast. Four months ago she had two abscesses of the right breast. Three weeks before admission an abscess formed in the left breast, which was treated by poulticing. She has right hemiplegia (syphilitic ?) of eighteen months' duration. There is also a marked family history of tubercle. She had one child stated to be healthy, and four months after her confinement the left breast "got bad." The woman was pale and extremely ill. There was a large black circular slough at the inner side of the left breast, which appeared like a gumma. Under treatment the slough separated, having an unhealthy granulating sore the size of the palm of the hand, with a central opening, from which on pressure foul pus exuded from the depths of the gland. On 25th September, the parts having been carefully cleaned, the sore, including the orifice of the sinus, was excised by a wedge-shaped incision, which removed all the affected portions. A considerable cavity was opened up, crossed by sloughy bands of fibrous tissue, with loculi and pouches. This was scraped and flushed with Barker's flushing gouge, and rubbed out with iodoform. A free opening was made below, and a tube brought out at the thoraco-mammary junction. The wound was united with deep and superficial sutures, so arranged as to draw the whole surface together. The case did perfectly well, and a long linear scar marked the position of the operation for removal of the disease.

In a considerable number of instances the breast has been removed for abscess with thick walls, under the impression that a solid tumour existed (Fig. 13). The cases illustrative of this most important part of the subject must be studied in connection with the chapter on the diagnosis of carcinoma. It is worthy of note that when abscesses arise "spontaneously" in elderly women, there may be evidence of past suppuration, the abscess having originated in the site of old inflammatory trouble. Although removal of the mamma for old chronic abscess is a diagnostic error, yet it is questionable whether sometimes it is not the best treatment to adopt, if the surrounding mammary substance is indurated and diseased.

Residual Abscess of Breast taken for Tumour: Removal of the Entire Breast.—A married woman was admitted into a London Hospital in September 1891. She had six children. Eight years before a left mammary abscess had formed and burst, discharging for about two years. The left nipple had been retracted for six months, she had lost flesh rapidly and suffered from severe shooting pains. It was noted that the nipple was much retracted, and an indurated mass lay beneath it. There were no enlarged axillary glands. The entire breast was removed after consultation. A deep abscess was found beneath the old scar, the walls of it were adherent to the pectoral fascia and were thickened. The wound soon healed.

The following is a good example of abscess associated with retraction of the nipple, simulating tumour:—

A married woman was admitted into St. George's Hospital under Mr. Haward's care in March 1890. She had borne thirteen children, but has never been able to suckle with the right breast on account of retraction of the nipple. Her last pregnancy dated to five years ago, and the breast was then unaffected. Three weeks before admission, while ill from "pleurisy," she noticed a lump in the right breast below the nipple. It was painful, and a yellowish fluid exuded on pressure from the nipple. It was noted on admission that the swelling was hard and tender to pressure, situate beneath the nipple, which was markedly retracted. The swelling was opened by an exploratory incision, and some thick pus and blood escaped.

A similar case is the following:—

A young woman, aged twenty-eight, came to my out-patient department at St. George's Hospital on 17th March 1897. She had had one child two years ago, and had suckled with both breasts, nothing abnormal occurring. She had noticed a swelling for about six months in the left breast. It was not very painful. On examination the left nipple was deeply retracted and adherent to a hard globular swelling the size of an orange beneath it. The tumour was movable on the parts under it, but felt exactly like hard carcinoma. The glands in the axilla were not palpably enlarged. Iodide of potassium was administered, and a mercurial plaster spread over the breast, with cotton wool and a firm bandage. At the expiration of fourteen days, a definite sense of elasticity was felt at one spot, but the patient declined exploration. In ten days more an abscess burst and discharged spontaneously, and when last seen the indurated swelling was rapidly disappearing. Any case more like carcinoma than this one it would be difficult to conceive. The youth of the patient made me suspicious, but only knowledge of the deceptive nature of these cases prevented me from being positive that it was carcinoma!

Some most remarkable and instructive cases bearing upon the question of dormancy of pyogenic organisms in old mammary abscess are here related.

A married woman, aged thirty, was admitted into St. George's Hospital on 1st October 1889. She has had five children. Nine years before, she suffered from an abscess in the right breast after a confinement Since then she has never nursed with the right breast. Six months before admission she was confined, and nursed with the left mamma only. A few months ago she began to suffer pain in the right breast. It became swollen and inflamed, and finally a "fair-sized" abscess formed just below the right nipple, which was opened and drained. There was no cause found for it. One can hardly doubt but that the vascularity and congestion excited by the pregnancy and lactation, permitted of the development of latent organisms, which otherwise would have done no harm.

A needlewoman, aged eighteen, whose health had always been indifferent, was admitted into St. George's Hospital on 16th July 1890. In 1889 she noticed a painful lump in the left breast, which arose from no known cause. This was opened in the London Hospital, and the wound, after remaining open for a time, healed. On admission it was noted that there was a swelling just beneath the old cicatrix, which was tender and fluctuated, and obviously an abscess. A small chronic abscess was also found on the dorsum of the left foot, so it is questionable whether in this case the affection was not tubercular.

A married woman, aged forty-two, was admitted into St. George's Hospital in August 1888. Sixteen years before she had an abscess of the right breast occurring during lactation. Since that she has been able to suckle with the right breast. Six weeks before admission, for no known cause, the right breast became painful, an abscess formed and burst in exactly the same place as the old one. A troublesome sinus formed, and this had not quite healed, on her discharge, after a prolonged sojourn in Hospital.

Abscess of Breast depending upon Necrosis of Rib.—A married woman, ætat. forty-one, was admitted into St. George's Hospital on 16th July 1890. A sinus existed in the left breast, which had been present for some months, having succeeded to the opening of what was practically an ordinary mammary abscess. On examination under anæsthetics, a thick-walled sinus was found, with some bone necrosed and bare at its deepest part. The walls of the sinus and the seventh rib were cut away and scraped, and the sinus gradually healed. A similar case is related by Birkett.[1] Here a delicate lady, aged twenty-eight, received an injury, and the abscess took upwards of two years to slowly form. Eminent surgeons expressed the belief that the swelling was cancerous, but ultimately an abscess formed, and some portions of rib exfoliated.

A married woman, aged thirty-five, was the subject of consultations at St. George's Hospital on 7th April 1897. She had noticed a painful swelling of the right breast for four months. She has had no children, and the enlargement was in no way connected with lactation. The woman was pale and ill ; at two points towards the sternal aspect of the breast plain fluctuation could be made out, and the skin was hot and pinkish in colour. The nipple was normal, but the axillary glands were slightly enlarged. An exploratory incision was afterwards made ; a quantity of caseating pus escaped, the appearance being that of a tuberculous abscess. As loculi seemed to have formed in the rest of the gland, the whole mamma was removed. It was then found that the mischief was dependent upon necrosis of the seventh rib, which was bare and rough towards its sternal extremity. On section the mamma presented most peculiar appearances. The sternal half was occupied by a sloughy abscess. The remaining portion was in a condition of mastitis, being dense and firm. On squeezing, worm-like masses of yellow and inspissated pus escaped from numerous orifices in the cut ducts. There was obvious secondary "purulent galactophoritis" around the large abscess. An examination of the pus showed tubercle bacilli in abundance.[2]

The wards of every hospital, the experience of every surgeon, afford examples of mammary abscess following blows and injuries. In some of these the pus is mixed with broken-down blood-clot, and it is obvious that the case is one of suppurating hæmatoma.

A single girl of eighteen struck her right breast violently against a door. It at once swelled and became very painful, and four days afterwards she was admitted into St. George's Hospital, on 29th March 1889. On admission the right breast was noted to be generally inflamed and very hot and heavy. Under elevation and evaporating lotions this subsided, but by 2nd April an incision was required for obvious fluctuation, and the patient was in a few days discharged wearing a tube. The end of the case is not given, but it may be assumed to have ended favourably.

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[1] *Diseases of the Breast*, p. 61.

[2] The appearances in this case reminded me of the branching suppuration so often seen round a hepatic abscess.

A single woman, aged twenty-one, was in St. George's Hospital under Mr. Holmes's care on 1st April 1868. Three weeks before admission she fell and struck her right side. She then noticed an increase in size of the right breast, which became hot and very painful. The right mamma was noted to be red, hot, tense, and very painful, with fluctuation at certain points. An incision evacuated a quantity of "sanious" pus. A sinus remained, which had ultimately to be laid open before sound healing took place.

An unmarried girl, aged nineteen, was under Mr. Lee's care in St. George's Hospital on 30th January 1867. Three or four months ago she struck her left breast against an open door. It remained tender and painful and soon commenced to swell. On admission all the signs of abscess were evident, and incision near the nipple evacuated much pus. Great difficulty was experienced in getting the sinuses to heal, and there was retention of pus evidently from want of free drainage.

A nurse, aged twenty, was admitted into St. George's Hospital on 13th June 1874. Three weeks before she had a blow from a child upon the left mamma. Considerable pain and swelling followed, and an acute abscess formed. The abscess was opened under gas by the house-surgeon, and a rapid recovery ensued.

A. H., ætat. thirty-five, a married woman, was admitted into St. George's Hospital on 16th January 1878. In the previous August she had received a violent blow over the left breast. In about a fortnight the breast became tender, and she noticed a hard lump on its outer side. Slowly the pain increased in severity, and the whole breast became more and more swollen. The patient has never been pregnant, and she seemed clear that the blow was the cause of her trouble. On admission she was in a condition of pain and fever; the breast was greatly, but "perfectly symmetrically," swollen. The skin was tense, and a little red and œdematous at the outer part. There was acute tenderness and general fluctuation. The nipple was a little retracted. Mr. Holmes made a free incision into the lower and outer part of the swollen breast, and let out about $\frac{3}{4}$ pint of sanious pus. On introducing the finger, the mammary gland could be felt completely dissected away from its natural attachments, lying "in the midst of a large pus cavity." She made a rapid recovery after incision and drainage. This is one of the few genuine cases of submammary abscess I have been able to find in the records of our Hospital.

A young married woman, aged twenty-eight, blonde, delicate-looking, the mother of three children, came to the out-patient department of St. George's Hospital on 27th August 1894, with an abscess of the left breast. The gland was enormously enlarged and swollen symmetrically, hot, intensely painful, with the skin congested, tense, and shiny. Towards the axillary aspect the skin was red and slightly œdematous, and here a sense of elasticity could be elicited on deep palpation. The woman was haggard and feverish, not having slept for many nights, and her tongue was excessively foul. The nipple stood out well from the breast and was not sore or cracked, thus rendering it suspicious that the abscess had originated from some other cause. On inquiry it was elicited that a fortnight before, her husband had struck her on the breast, which before then had been well, but which afterwards speedily swelled and became painful. She had never suffered from sore or cracked nipples. The abscess was opened by a small puncture by the assistant house-surgeon under nitrous-oxide gas, and the knife had to enter to a depth of an inch or more before a copious flow of pus occurred. A tube was inserted and the breast enveloped in salicylic wool with pressure by a breast-bandage.

Abscess of the mamma in young girls may occur without apparent cause.

A girl, aged fifteen, was admitted into St. George's Hospital on 6th March 1865. For full three months her left breast had become swollen and painful without cause. An abscess opened spontaneously by a small opening near the nipple, but it soon closed. The abscess was again opened, and after drainage and thorough evacuation, it got perfectly well.

P. H., ætat. eighteen, came to the out-patient department on 25th June 1896. She was pale and anæmic, and complained of a painful swelling in the left breast and over the ribs. She has had pain for about fourteen days. No history of a blow. Just beneath the left mamma, which is enlarged, is an exquisitely tender fluctuating swelling the size of a bantam's egg. The skin is not reddened and there is little local heat. The integument over the left ribs in the axillary line is very hyperæsthetic. The mother asserts that the girl has had several "shivering fits." The swelling was opened by the assistant house-surgeon, and nearly ℥ii. of rather thick curdy pus let out. There was no necrosis. The cavity, which was fairly extensive, did not reach the ribs. A drainage-tube was inserted, and a gauze dressing applied.

A girl, aged eleven, was in St. George's Hospital in 1884 under the care of Mr. Holmes. The right breast had been swelling for four months, and was the seat of an obvious abscess, which was opened. "Counter-openings" had subsequently to be made.

The following cases of mammary abscess were found in elderly women, and their origin was often very obscure.

E. J., aged thirty-four, and married, was admitted into St. George's Hospital on 2nd September 1875. For two months she has noticed a swelling in the right breast. Her last child was born thirteen years ago, and she knows of no reason for the present attack. The skin had lately become red and thin. Incision and drainage evacuated a quantity of pus and the patient was soon well, but there was no suggestion as to any cause for the suppuration.

A married woman, aged forty, who had not been confined for many years, was admitted into St. George's Hospital in April 1884, suffering from a tumour of the left mamma. Nine months before, a painful lump had formed in the left breast, but this nearly disappeared under counter-irritation and pressure. Four months before admission it commenced to increase again, without obvious cause. On admission the woman was noted to be thin and spare. There was a rounded tender elastic tumour in the axillary part of the left breast. The skin over it was reddened. The axillary glands were not affected. The temperature was normal. An exploratory incision revealed a large abscess, which was opened and drained in the usual way. The process of healing was tedious, and several "counter-openings" had to be made before the sinuses finally closed. No cause could be assigned for the formation of the abscess.

A married woman, aged forty-seven, was admitted into St. George's Hospital on 30th May 1883, under the care of Mr. Pick. She had never been pregnant, and gave the history that her mother died of cancer of the liver. She had noticed a tender lump in the right breast for five months. There was a painful, hard, circumscribed tumour, the size of a small orange, deep in the right breast. The nipple was not retracted, and the skin was unaffected, the axillary glands were not to be felt. A consultation was held upon the case, but no one would give a positive opinion as to the nature of the swelling. An exploratory incision was made by Mr. Pick, and an abscess was revealed. The similarity to a malignant tumour was very close.

Abscess of the mamma, though not associated with lactation, may, in delicate women, cause much destruction of the mammary tissues.

A married woman, aged forty-eight, was admitted into St. George's Hospital on 2nd May 1877. Her last child was born three and a half years before admission, and subsequent lactation was normal. Six weeks before admission the right breast, without obvious cause, became swollen and painful. Incisions had been made before her admission evacuating pus, but with no marked relief. Three sinuses were found discharging near the nipple. Counter-openings were made, and there was a profuse discharge, with general and local relief. For some months a hard tender swelling remained at the upper part of the breast, which only slowly subsided.

A case where the entire breast was purposely removed for a chronic abscess with much indurated tissue around is as follows:—

On 28th August 1894, I saw a spare, healthy-looking woman, aged twenty-seven years, a patient of Mr. Hugh Webb of Parson's Green, who was suffering from a tumour of the left breast. She had never been pregnant. She had noticed the occurrence and gradual enlargement of the tumour for about four months. The nipple was deeply retracted, and beneath it, incorporated with the breast tissue, was a hard mass, feeling in all respects like a mass of cancer. The axillary glands were not affected. The family history was good. There had never been discharge from the nipple. An exploratory incision was made into the mass and some pus welled up, but the tissue was so dense, and bore so exact a resemblance to cancer, that it was thought wise to remove the whole breast. The abscess was the size of a small walnut, situated deeply beneath the nipple, and surrounded by hard indurated tissue to the extent of half an inch. Dr. Rolleston kindly examined this tissue with the microscope, and I append his report: "Groups of atrophied and compressed mammary tubes enclosed in well-formed old fibrous tissue . . . sections of the wall of the abscess showed well-formed fibrous tissue with an irregular lining of small cells, among which there are some traces of hæmorrhage."

This case shows, that even after exploratory incision, a surgeon may feel doubts as to whether the collection of pus is surrounded by scirrhous cancer or not. In such cases, the breast is so far disorganised, that entire removal is never to be regretted, and the microscope alone can certainly determine the presence or absence of cancerous infiltration.

Chronic Abscess simulating Scirrhus.—A woman, aged forty-four, was admitted into University College Hospital for a tumour of the breast, which had originated in a blow inflicted three months before. A blow had also been inflicted on the same breast three years before. Removal of the breast had been advised at an infirmary. There was an induration of stony hardness. The surface was roughly lobulated and the margin indurated ; the nipple was retracted, and there was one enlarged axillary gland. On incision an abscess was found.[1]

Chronic Abscess simulating Cancer.[2]—A woman, aged forty-four, received a blow on the breast three years before admission, and again, three months before admission. There was an induration in the breast of stony hardness. The surface was roughly lobulated and the margin indistinct. Removal of the breast had been advised at another institution. The nipple was retracted, and there was one slightly enlarged gland in the axilla. An incision was made, and an abscess incised, drained, and fomented. She was discharged cured on the fifty-first day.

Abscess of Breast supervening upon Old Inflammation : Residual Abscess and Simulation of Scirrhus.—A pale, emaciated married woman, aged forty, saw me at the Waterloo Bridge Hospital for Women on 25th November 1894, for abscess in the right breast. She stated that the gland had become swelled and painful for some weeks, from no apparent cause. Four years ago she had two abscesses in this breast during lactation. These were opened, and they got better in about six or eight weeks. No tuberculous history, but she has lost twelve children from different complaints. On examination, the right breast is irregularly swollen, and internal to a deeply-retracted nipple are two rounded, red, fluctuating swellings, obviously abscesses. The breast was very hard and indurated. 5th December.—The abscesses were opened by small incisions. Boric lotion was applied and a breast-bandage. 3rd January.—The sinuses have healed, but there is a hard mass in the breast which feels exactly like a scirrhous cancer. The breast-bandage with the cotton-wool pressure to be continued. Large doses of potassium iodide to be given internally. 1st February.—Under pressure the formidable hard swelling quite disappeared, and nothing is now left but scars on the gland, and puckerings about them. The pus was examined for me by Dr. Slater, and found to contain the staphylococcus aureus in abundance.

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[1] *Univ. Coll. Hosp. Reports*, 1884, p. 51.

[2] *Ibid.* 1884.

Abscess of Breast simulating a Fungating Tumour.—A fat married woman, mother of eight children, aged sixty, was admitted into Burton Ward of St. George's Hospital on 8th December 1882. Seven or eight months ago, she began to suffer from "darting pains" in the right breast, and at the same time she noticed the organ becoming rather "knotty." In the last month the swelling has much increased, and has become hot and tender. On admission, it was noted that there was a prominence near the nipple, which was not retracted. This prominence was black in colour, and serum escaped from it ; it looked as though soon about to fungate. The skin was inflamed and hard, but not adherent ; beneath it could plainly be felt a firm hard tumour. There were no enlarged glands. A copious discharge of thick pus took place spontaneously in a few days from the prominence near the nipple, and the swelling rapidly disappeared. In a month's time the patient was discharged from the hospital. No note is made of any true tumour having existed.

It is not needful to multiply instances of the similarity between chronic mammary abscess and true tumour growth, and the following striking cases must force the value of exploratory incision upon the attention of all readers :—

A married woman, aged thirty-seven, was admitted into St. George's Hospital in October 1880. She had been married for six years, and had one child four years old. Six years ago a fatty tumour was removed from the left shoulder by Pollock. Five months ago the left breast became the seat of a *throbbing* pain, and she noticed a swelling above the nipple which slowly increased in size. Five weeks before admission it increased very rapidly, and in alarm she sought advice. The swelling is described as oval, very heavy and *elastic*. The nipple was deeply retracted. The skin was not adherent, but was marked by large blue veins. The axillary glands were not implicated. At a full consultation, removal of the breast was decided upon. In making the first incision a jet of pus issued forth, and a large abscess was found, occupying principally the submammary region. It was drained in the usual manner, and the breast was saved.

A married woman, aged thirty-three, was in St. George's Hospital in September 1891. She had an abscess following "confinement" in the left breast, eight years before, and has never been able to suckle with the breast since. The nipple has been retracted for about six months. The gland was indurated and hardened, and at a consultation, removal of the breast was decided upon. This was carried out in the usual manner. In dissecting the breast off the pectoral fascia a large abscess was opened, the posterior wall of which was adherent to the pectoral fascia. It was surrounded by much thickened and indurated tissue, and only discovered just in time.

These cases may be perused with advantage after reading the chapter on the diagnosis of carcinoma of the mamma. The similarity to cancer is indeed their principal importance.

The removal of tumours and cysts from the substance of the breast is exceedingly apt to be followed by suppuration and abscess, unless strict asepsis is carried out, with careful drainage of the deep cavities often left by these operations.

G. D., aged eighteen, was admitted into St. George's Hospital in April 1874. A year before, a tumour (adenoma?) was removed from the breast, and ever since she has had discharge, the wound never having soundly healed. There was a large abscess in the upper part of the breast, which "drained" badly by the sinus. This was freely laid open, and a large quantity of pus discharged. Ultimately the parts soundly healed.

The following cases and remarks will further exemplify the symptoms and treatment of tuberculous disease of the breast:—

In June 1893 I saw, at the Hospital for Women and Children in the Waterloo Bridge Road, a pale, emaciated, worn woman, aged forty-three, who had the scars of old gland disease in her neck, and had lost her two children from "consumption." She herself had twice had hæmoptysis. She had suffered from the left breast for about twelve months, "a lump" having broken and discharged. On the axillary aspect of the left mamma was a ragged cavity, with overhanging, undermined edges of a livid colour. The axillary glands were much enlarged, and in one of them distinct fluctuations could be felt. Close to the abscess cavity the breast was thickened and much indurated. The woman attended for some months, and I opened two small tubercular abscesses in the axilla. She improved in health, but was ultimately lost sight of. The ulcer in the breast never soundly healed.

A healthy married woman, aged thirty-eight, had suffered from a swelling in the left breast for about eighteen months. A second swelling had existed for six months. There was only slight pain and discomfort. No history of injury or of tubercle, but an aunt had died of cancer. There was no œdema or redness of the skin, which was freely movable over the tumours. An ill-defined lump could be found in the axilla. One of the swellings, being elastic, was suspected to be a chronic abscess, and was opened. There was a discharge of thick pus and caseating material, from a cavity lined by granulations. The director was forced from this into other cavities ; there were seven or eight in all, as large as hazel-nuts. Free drainage was established. No bacilli were found in the discharge. She was discharged from the hospital not quite healed, but soon returned with a sinus discharging watery pus. The axillary glands had considerably increased in size. The whole breast was now removed, and the axilla cleared out. In the glands were innumerable patches of caseation. She made a good recovery, but the subsequent history is not told. Comment is made on the absence of bacilli, which wrongly negatived removal in the first instance.[1]

The following case is a typical one of tuberculous disease in both mammary glands, in a patient the subject of advanced tubercular disease :—

A pale, emaciated woman, a street hawker, aged fifty-two, came to St. George's Hospital in January 1897, for advice about her breasts. She had a husky voice, laryngeal phthisis, and a fatty tumour over the buttock as large as a cocoa-nut ; at the upper and inner quadrant of the left breast is an ulcer the size of a shilling where an abscess has burst and discharged. Thin watery pus flows from it, and the edges are livid and undermined. In the lower part of the mamma is a swelling the size of a large walnut. It is hard, but at one spot the skin is reddened and there is obvious fluctuation. There is a purulent discharge from a sinus near the left nipple. Tubercle bacilli were present in the discharge on both sides, but they were few and difficult to detect. The axillary glands were apparently not affected. At the College of Surgeons this case was pronounced by the majority of the examiners to be syphilitic, and accordingly I placed the patient upon potassium iodide and iron. The sinuses soon closed, and I cannot but regard this as a mixed case of tubercle and syphilis.

Durant describes the disease as disseminated or confluent, when the separate masses and nodules have coalesced.

Gant, in describing a case under his care, notices the curdy discharge, the puckered cicatrix resembling cancer, and scars in the neck from old tubercular mischief.[2] Shattock brought before the Pathological Society[3] a most important case of tuberculous mamma, when the breast was removed by Mackellar.

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[1] Lane, *Brit. Med. Journ.* 13th September 1890.

[2] *Science and Practice of Surgery*, vol. ii.

[3] *Trans. Path. Soc.* 1889.

The patient was a single woman, aged twenty-one. She had noticed a "lump" in the left breast for six years. It had only lately been painful. A swelling had been noticed also in the left axilla for twelve months. On cutting into the tumour a typically tubercular abscess, the size of a large hazel-nut, was evacuated. The portion of mamma affected was excised, and the patient made a good recovery. Hebb[1] relates a case, where a phthisical patient, aged thirty-five, the mother of eight children, had a hard nodule in the left breast with a retracted nipple. This patient had suffered from hæmoptysis, and five of her children had died of tuberculosis. There were a few indurated cords leading towards the axilla. In the discussion at the Pathological Society on 25th May 1889, cases were mentioned by several observers, and Dr. Payne alluded to an instance of a tubercular abscess near the nipple of a child, which subsequently died from general tuberculosis. The important question of the transmission of tubercle to an infant from the breast of a tuberculous mother naturally excited attention. Most opinions were in favour of the possibility of this, though one observer pointed out that he believed Colles' law held good with regard to tuberculosis as well as syphilis, that a mother suffering from constitutional tuberculosis could not infect her child. The frequency of the disease in the udders of cows is well known, and the likelihood of tuberculosis in early life being caused by tuberculous milk of cows is only too probable.

Pyæmic Abscess of the Breast.—Occasionally it happens that abscess may form in the breast, secondary to general pyæmic infection. This is exceptional, and was probably more common formerly than now, when severe cases of pyæmia, associated with multiple abscesses, were so frequent after surgical operations. Spiegelberg's observations on the rarity of this affection have been quoted. I have seen pyæmic mammary abscess in a case of acute infective periostitis, in pyæmia after removal of the opposite breast, and in an indetermined case of sepsis. In all these cases there was great submammary infiltration. The rarity of these complications of pyæmia will not puzzle the surgeon.

The patient may be non-lactating, the nipple healthy, while the fever rigors and sweats of pyæmic infection are prominent. Some evident source of infection will probably be present, as a recent operation wound, or a neglected and septic abortion. The treatment is sufficiently obvious, and is that of pyæmic abscess elsewhere. Probably analogous to these cases are the abscesses which sometimes arise in the breast or axilla, in relation with open and foul cancerous ulcers of the mamma. Pyæmic inflammations of the breast are rare after childbirth in these days of antiseptic midwifery.

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[1] *Trans. Path. Soc.* 1888.

I have only been able to find one case of abscess of this nature in the records of St. George's Hospital in thirty-five years, though it is right to point out that in fatal cases of pyæmia a small abscess in the breast may readily have been overlooked. This case is related in the chapter on affections of the male breast. Conversely, mammary abscess may prove fatal from pyæmia. Such a result is quite exceptional.

A married woman, aged forty-five, was admitted, under Mr. Lee's care, into St. George's Hospital, 8th May 1875. She was six months advanced in pregnancy, and had a sloughy sinus in the left breast, the result of a neglected mammary abscess. She was covered with general eczema. Sloughs continued to be discharged from the wound, and in about three weeks' time rigors were observed. She was prematurely (?) confined of a female infant, which did not long survive. On 2nd July it was noted that all the symptoms were worse, and the left lower extremity was greatly swollen, from thrombosis of the left femoral vein. She shortly afterwards sank and died.

Suppuration in connection with Tumours and Cysts.—Suppurating carcinoma is very rare. Indeed, should a swelling in the breast suppurate, this may rather be looked upon as a proof that the disease is not cancerous. Yet this rule has its curious exceptions.[1]

A case is related in vol. xv. of the *St. Bartholomew's Hospital Reports*, where a woman, aged thirty-eight, six months pregnant, had a hard tumour in the breast for several months. Soon the swelling became red and fluctuating, and on opening it pus escaped. It soon became clear that "more serious trouble" remained behind. The breast was removed, and the tumour was found to be a well-marked case of suppurating carcinoma. In connection with this case a most interesting example of the converse is mentioned. A woman, aged thirty-nine, had a hard lump in her left breast, a retracted nipple, and an enlarged axillary gland. The skin over the tumour was quite adherent. The swelling had been noticed for six months. She had not suckled or been pregnant for seven years. At a consultation, opinions were unanimous that the lump was a solid tumour, most likely scirrhus. On exploratory incision an ounce or more of pus was evacuated, and an "end was made of the tumour."

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[1] In connection with suppurating scirrhus, see the remarks on inflamed cancer on p. 358, and on carcinomatous cysts on p. 366.

Again, carcinoma has even been known to actually originate in the floor of an abscess cavity. The late Mr. Baker, in vol. xxiii. of the *St. Bartholomew's Hospital Reports,* mentions a most striking case in support of this statement.

A woman, aged fifty, had a discharging sinus in the right breast, which had existed for nearly four months. The deeper parts of the breast were occupied by a tumour growth. Mr. Baker removed the whole mass, and discovered a carcinoma the size of a small orange growing from the abscess cavity.

A woman, aged thirty, had the left breast removed for cancer at St. George's Hospital in September 1872. In the centre of the growth, described as the size of a hen's egg, was a suppurating cavity. The growth is described as having broken down into "a large abscess."

A married woman, aged seventy-six, was admitted into St. George's Hospital under Mr. Holmes's care in May 1883, with an ulcerating carcinoma of the left breast which had existed for over two years. There were enlarged glands in the axilla, and between these and the cancerous mass, which was situated centrally, was a large fluctuating abscess. This was opened and a quantity of pus evacuated. After consultation, the cancerous mass and some of the pectoral muscle, as well as the axillary glands, were freely removed. The wound long remained unhealthy, suppurating freely, but it at length closed, and the patient recovered.

A childless married woman, aged forty, had for eight years an abscess and discharging sinus near the right nipple. It would heal and then break out again. At the end of this period a hard lump formed, and "a cancer sprouted right out of the hole" in the breast. The mamma was amputated at University College Hospital, and the patient was admitted for recurrence, of which she died, into St. George's Hospital, in May 1884.

In the days when caustics were employed to remove cancers of the mamma, surrounding abscess and cellular inflammation were often enough exemplified. I find that in the year 1867 a patient was treated in St. George's Hospital for scirrhus of the left breast, with the chloride of zinc paste inserted in the form of arrows into the diseased mass. The whole breast sloughed out, but severe rigors and fever ensued, and a large abscess formed in the other breast. The patient died apparently from pyæmia. A good instance of abscess of the breast associated with ulcerated carcinoma is the following:—

A woman was in St. George's Hospital in 1884 with a hard scirrhous cancer growing in the left breast, and which had existed for two years. Lately the tumour had ulcerated, the nipple was retracted, and the skin adherent. There was a large abscess stretching from the nipple to the axilla. The abscess was opened, and much foul pus evacuated. The tumour and pectoral muscle to which it was adherent were removed. The patient recovered favourably.

A married woman, aged sixty-seven, was admitted into St. George's Hospital on 1st October 1892. Her father had died of "cancer." She had children, and never any difficulty in suckling. Quite fourteen years ago she had a discharge of blood from the left nipple, and then noticed a slight swelling. Lately, the breast has increased considerably in size. On admission, a semi-fluctuating tumour occupied the centre of the breast. The nipple was retracted. The skin was reddened, but not adherent. There was a good deal of pain and tenderness. The axillary glands were enlarged and hard. On 6th October an exploratory incision was made, and a quantity of greenish pus escaped. It was thought that this came from a suppurating cyst. A hard mass was felt beneath, which had all the characters of scirrhus, and the whole breast was therefore removed. The axillary glands were not thought to be implicated. The disease was proved to be carcinomatous.

A single woman, aged thirty-three, was in St. George's Hospital in 1889 suffering from a tumour of the left breast. She stated that this had existed for six weeks, but the history was very doubtful. Her mother had died from uterine cancer. The patient had always suffered from a painful and retracted nipple. On examination there was a large, round, tender, movable swelling in the upper part of the left breast, and the skin was non-adherent. There were some enlarged axillary glands. At consultation exploratory incision was decided on. This being performed, pus was discovered, and the sac of the supposed abscess with the surrounding breast tissue dissected out. It was later discovered that papillary growths were present on the walls of the sac. Thus the case was really an example of suppurating cyst, but such instances are exceedingly rare.

In the year 1895, Mr. Bennett showed at consultations at St. George's Hospital a large cystic sarcoma. One of the cysts discharged pus abundantly, and there was practically a sinus communicating with a large abscess cavity. This had resulted from a puncture with a lancet made outside the hospital into one of the main cysts in connection with the growth, allowing the cystic cavities to become septic, and hence to suppurate.

In the chapter on operative surgery, the great importance of suppuration in connection with carcinoma will be again alluded to, and the subject may profitably be read in connection with the diagnosis of carcinoma.

A very exceptional variety of mammary abscess is caused by a foreign body, as a needle or a splinter of wood, accidentally or designedly thrust into the breast. More often this produces a patch of circumscribed induration of a curious nature than an abscess, and this subject is therefore properly considered in connection with chronic mastitis.

Further Remarks on Treatment.—The majority of the points in the treatment of mammary abscess have already been touched upon. A few concluding remarks of the nature of a summary will not be out of place. The management of these cases is often thought to be simple and easy. This is by no means always so, and as the subject is so important to those engaged in general practice, I have thought well to amplify it.

Attention must be forcibly drawn to the great importance of prophylaxis. When a young woman is pregnant for the first time, the condition of the nipples should always receive attention from the family attendant. Too often these essential organs are left compressed by tightly-fitting corsets, and when the advent of lactation arrives, are inefficient for the task they are intended for. There is no more fruitful source of abrasions and irritations about the nipple than imperfect formation, and attention to the proper development of the nipples, especially in interdicting pressure by tightly-fitting stays and corsets, should be urged on the mothers of young girls by the family physician. The free use of cold water locally is also of importance. Defective or unhealthy nipples, are the most important predisposing causes of sores and cracks, and consequent abscess and other diseases of the breast.

The belief that mammary abscess is usually due to lymphatic absorption, or possibly to duct-infection, points forcibly to the value of preventative treatment of the affection.

The nipples of lactating women should receive close attention. They should be bathed in boric lotion, or a solution of 1 in 1000 perchloride of mercury, and carefully dried. The infinitesimal quantity of mercury which may afterwards enter the mouth of the infant can be disregarded.

At our large lying-in hospitals I am informed it is the practice to wash the nipples with boric acid lotion. Should there be any cracks or fissures, these are washed with perchloride of mercury lotion (1 in 2000), "ung. acidi borici" is applied, and the customary nipple-shield employed. Should engorgement and painfulness of the breast supervene, the gland is once well emptied with an exhausting apparatus, and belladonna is applied, fluids restricted, and the bowels opened by a saline purge.

It does not seem an exaggeration to say that abscess of the breast in association with pregnancy and lactation is largely a preventable malady, and should practically never occur. Prior to delivery the nipples should be well bathed twice a day with astringent lotions. In some cases the nipples are absolutely malformed, and never become properly prominent, and in such abscess may occur even with the best care.

The treatment of any variety of acute mammary abscess in lactating women, will be divided into general and local. It is usually advisable to wean the child at once, and should the opposite breast be engorged, the milk must be drawn off two or three times, once daily, by some form of pump.[1]

All fluids must be restricted, and the bowels freely opened. After the incision a mixture containing small doses of iodide of potassium, gentian, and belladonna, may be administered for a week. Afterwards ferruginous tonics, especially the carbonate of iron, are highly beneficial, and if the patient can afford it a change into sea-air is usually to be recommended. In speaking of the diagnosis of acute abscess, reference has been made to the difficulty of seizing the right time for incision, and the patient and her friends are only too ready to delay this as long as possible, persisting in poultices or fomentations until the skin is seriously undermined and the mammary substance extensively destroyed by ramifications of the abscess cavity. Severe and dangerous bleeding may be caused, by making deep and free incisions through much thickened and inflamed tissue. In cases of doubt, and they are many, an exploratory puncture should be made with a fine tenotome. Even this should not be done until by careful palpation with the pulps of the index-fingers the sensation of deeply-seated fluid is elicited. As a rule, gas and ether should be administered in these cases, so that if pus has formed, the surgeon can proceed to open in a dependent position, flush out the abscess cavity, and plan his treatment without the hurry associated with the transient anæsthesia of nitrous oxide. In cases of abscess about the nipple, when the pus is quite subcutaneous distinct fluctuation may be readily detected, and a mere puncture under gas may suffice. When the purulent collection lies deep in the breast, should the surgeon wait for plain superficial fluctuation, he would delay surgical measures until serious disorganisation had taken place. I make it a practice never to operate in these cases unless I am assured of a sensation of elasticity and deep fluctuation, and this, as is true of other deeply-seated collections of pus, can only be certainly appreciated by those who have good clinical experience.

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[1] *Lancet*, 7th March 1896.

In opening a mammary abscess many precautions must be adopted. The remarks here made apply only to small and superficial collections. In the first place, I totally disagree with those surgeons who advocate a free anterior incision in these cases. Acute mammary abscess is common in the breasts of young women, and a scar to them is a matter of primary importance. The incision should be placed as far from the front of the gland as can be managed, and always in a direction radiating from the nipple. A dependent position should, if possible, be selected, but if the abscess is already "pointing" anteriorly that locality must be of course selected. The skin of the breast and adjacent thorax should be well cleansed with hot carbolic soap and water, and then sponged over with ether, and finally with a hot solution (1 in 2000) of perchloride of mercury and rectified spirit. A small double-edged knife, strictly aseptic and exceedingly sharp, should then be introduced, and as small an incision made as the surgeon estimates will evacuate the abscess cavity. The greatest difference of opinion exists as to the advisability of squeezing out the pus and washing out the cavity. The writer has seen the best results from the rather antiquated practice of allowing the abscess to evacuate slowly, a fine tube being introduced, or a strip of iodoform gauze, to prevent closure of the incision. Dry dressings, as boric or iodoform wool, should be used, a small circular piece of "green protective" being placed round the tube to prevent the wool sticking to the wound. Should there be much discharge, the wool-dressings must be frequently changed, and the parts cleansed by washing with warm boric lotion. I have never seen any good results follow the practice of daily distending the cavity with antiseptic fluids, which mechanically separate the walls of the abscess and prevent union. The tube may be shortened daily, and so soon as the tenderness and swelling have diminished, there is nothing which so hastens the sound healing of the resulting sinus as sponge pressure. A large, flat, soft Turkey-sponge is wrung out in warm carbolised lotion and laid upon the breast. An opening is cut in the sponge where the tube comes out, and this opening is filled with iodoform wool. A thick layer of the "Gamgee" tissue acts equally well. Finally, a firm breast-bandage is applied, and the arm should be bandaged to the side, while the forearm is secured in a sling. The latter detail, that of fixing the arm to the side, is very important, especially when the opening is into a submammary abscess. When any part of the abscess cavity is in contact with the pectoral fascia or muscle, movements of the arm may keep the sinus open *ad infinitum*, and difficulties are often experienced in such cases from want of adoption of this simple precaution. The patient usually recovers rapidly when once the pus is evacuated. Great care should be taken at first to change the wool-dressings very frequently, and not to allow the skin to get sodden with pus. A general purulent eczema of the skin, very chronic and inveterate, may readily be produced by infective pus in fair, blonde women. In opening the mammary abscess of an infant, a small puncture only should be made and the parts kept clean and dry with boric wool. Warm water containing no chemical should be used for syringing. These cases present no difficulty, and an opening should always be made early in the case before the skin is undermined. In the true submammary abscess—which I have stated is exceptional—where the whole breast is pushed forwards by suppuration beneath it, the opening should always be made in the thoracic mammary furrow, so that the scar may afterwards be concealed; and generally speaking, the surgeon should always aim at placing an incision to evacuate abscess as near the lower thoracic aspect of the breast as possible.

Beale, in the *Lancet* for 7th March 1896, advocates the treatment of mammary abscess by opening with a trocar and cannula, and applying the exhausting bottle to the aperture. While I am ready to admit that this treatment might be applicable to small superficial abscesses, I should hesitate to apply it to deeply-seated collections of pus with complicated loculi, in the substance of the gland.

In perusing the history of a large number of cases of mammary abscess, I have been much struck by the obstinate course of not a few of them, and the repeated operations that have been needful before sound healing could be obtained. Accordingly, I wish strongly to point out that in cases of abscess extending at all deeply within or beneath the breast, the treatment by anterior incision just spoken of, is seldom sufficient to ensure proper drainage, and a more thorough and elaborate method should be resorted to. The principle of drainage in a dependent position is not novel ; it is a leading surgical canon, but I feel sure it has been much neglected in the treatment of mammary abscess, and I drew forcible attention to this in a paper read before the Medical Society of London in 1896. In extensive abscesses, I hold it to be very essential that the large opening needful to drain them adequately should be hidden from view. If such cases are treated, as they too often are, by a mere anterior puncture made under nitrous oxide gas, the pus burrows extensively. Many openings have to be made, and after a tedious illness the patient recovers with the breast marked by many seams and scars,[1] a matter of no small moment to women in a good class of life.

I will now describe the method of treatment I have found efficacious and safe, trusting that those who have extensive practice among parturient women will give it their careful consideration. So soon as elasticity and deep fluctuation are evident, an incision is made radiating from the nipple just large enough to admit the index-finger of the operator, and this is deepened until pus flows. The finger is now passed into the cavity, and in the vast majority of cases it will be found that the end of the digit may be brought fairly near the surface in a dependent position, and this is generally at the thoraco-mammary junction. In this situation it may especially be noted that scars are afterwards hidden from view. Sometimes the finger passes towards the axillary margin, and occasionally the cavity is so large that a stout bent probe must be used to indicate the most dependent part of the abscess. In this situation, the gland being well raised by an assistant, a free opening is to be made, large enough to well evacuate the pus, and the finger being now introduced through this the inferior opening, the operator will be surprised to find that the pus has burrowed about, and is contained in loculi bounded by fibrous septa. All such septa and loculi must be broken by the finger, and the numerous irregular spaces thus converted into one cavity. It is especially noteworthy that in many instances quite a narrow channel towards the nipple connects the main cavity of the deep abscess with the more superficial collection of pus opened anteriorly ("shirt-stud" abscess), and it will then be clearly understood how inefficient is drainage in the practice of those, who are content with a small superficial incision in these cases. The remainder of the treatment is obvious: the cavity is well flushed out with whatever antiseptic agent the operator fancies, and a full-sized tube is introduced from below. I always use simple hot water in these cases, flushing powerfully, to mechanically remove all purulent collections. The opening made near the nipple is closed with fine horsehair and painted with collodion. It readily unites with only a faint scar, and the free drainage prevents the possibility of the re-collection of pus and a necessity for further operation. The tube, a very large one, can be left in the cavity as long as needful, and is slowly shortened and withdrawn. It may seem superfluous to mention that the drainage-tube should be secured with a piece of silk, but the fact of the tube having entered an abscess cavity, and having been forgotten and retained, or only removed by a troublesome operation, must not be lost sight of. The unsightly scar is completely hidden by the position and volume of the gland above. Should an instance of the rare affection termed diffuse phlegmonous abscess present itself, the treatment will consist in the making of free incisions, evacuation of sloughs, packing cavities with iodoform gauze, and free supporting of the general strength by wine and generous diet.

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[1] In one case treated by myself when a house-surgeon, no less than six operations were needful, the illness of the patient extending over two months. Looking back upon this and similar cases, I can plainly see that the incisions were inadequate and placed in a faulty position.

The right treatment of chronic abscess of the breast is a matter of greater difficulty to advise. The importance of exploratory incision in such cases will be often raised, and I would here make a statement which may seem too absolute, but which experience and a perusal of the literature of the subject permit me to positively advance. There is no symptom of hard carcinoma of the breast which may not be simulated by a chronic abscess enclosed in a dense mass of inflammatory material, and unless exploratory incision is made, as a matter of course grave errors of treatment will occasionally arise. The diagnosis of chronic abscess being established by incision, one of the first thoughts which should arise is as to the presence or absence of tubercle. The thin and watery nature of the pus, with the presence of caseating material in the walls of the abscess, is one of the best naked-eyed tests that can be applied. The presence or absence of tubercle bacilli is not a reliable test. These organisms are often not to be found in abscesses undoubtedly tubercular. Many writers seem to be in favour of removing the entire breast in cases which appear to be of a tuberculous nature. With reference to this very important point in operative surgery, much will depend upon the extent of the disease. In disseminated tubercle, where several abscesses or masses of caseating material are dissemi-

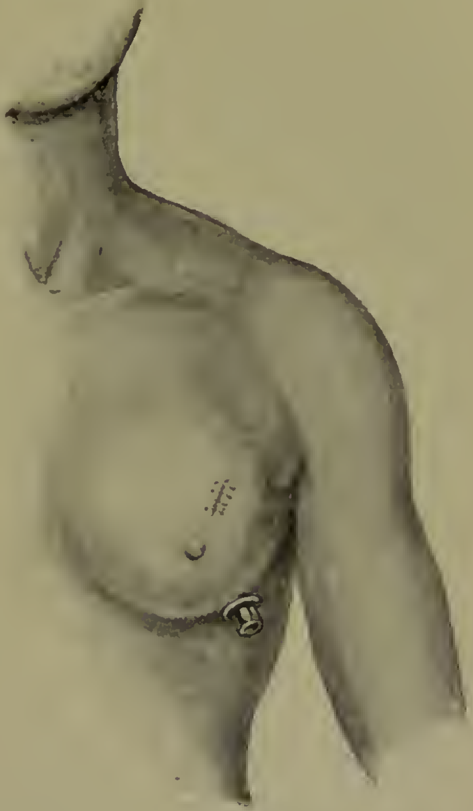

FIG. 14.—An intramammary abscess drained by a large opening from below, with the incision united anteriorly.

nated in the breast, removal of the entire organ, with possibly the axillary glands also, may be the right treatment to adopt, but the surgeon must carefully consider whether erasion will not suffice.

With regard to non-tuberculous chronic abscesses, there is again no absolute rule. When the abscess is surrounded by tolerably healthy mammary tissue, and has moderately thick parietes, the free use of the spoon, with scraping and flushing and drainage in a dependent position in the thoracic mammary furrow, will give good results. But if the abscess is enclosed in a dense mass of inflammatory tissue infiltrating the greater part of the breast, and especially if the patient be at the age when carcinoma is frequent, removal of the entire organ is, in my belief, the wiser course to pursue. Regarding this question there is room for much difference of opinion. It is always most difficult in practice to determine at the moment what is best for the patient, and the operative treatment of chronic abscess of the breast is one that will ever give rise to professional differences. I can only assert my belief that breasts are removed too frequently for these affections, and that free drainage in a dependent position, with erasion and flushing, will negative the necessity for the more serious operation in the vast majority of cases we meet with in practice, and preserve an organ the loss of which is always associated with great mental distress to the patient.

In the treatment of galactophoritis, Budin[1] advises that the pus should be squeezed out by firm pressure from the periphery of the breast towards the nipple, and that afterwards a dressing of dilute perchloride of mercury or naphthol should be applied.

Lastly, it may be pointed out that in some cases of neglected abscess, with deep and irregular sinuses, healing may be so difficult to bring about, that total removal of the diseased breast is the only advisable treatment. I have performed this operation, and Marsh, in a paper read before the Harveian Society of London in April 1895, referred to two cases of post-mammary abscess where it was necessary to remove the breast, all other treatment, including free drainage, scraping, and prolonged rest, having failed.

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[1] *Med. Week*, 1893, p. 500.

After a mammary abscess has healed much induration and thickening often remains. Pressure should be maintained, and the iodides with iron administered internally. Gentle massage of the part with a 5 per cent ointment of oleate of mercury, has seemed to me to hasten abortion. Under these measures the gland will usually be restored to its normal condition, and if the reduction should be tedious, the surgeon must not hastily assume that a tumour is originating.

Hæmorrhage after opening Mammary Abscess.—It has occasionally happened that troublesome bleeding has occurred in cases of neglected abscess, when large ragged cavities are found in the breast substance. The hæmorrhage may occur from several sinuses at the same time, and is apt to prove extremely embarrassing. As far as possible, with due regard to subsequent scarring, the cavity must be laid open to the air, and well flushed with hot water at 110°. The bleeding will then usually cease. Should it not do so, it is usually quite hopeless to attempt to secure the bleeding vessels in sloughy and disintegrating tissue. The cavity must be plugged with some styptic, and I would here raise a strong protest against any of the iron preparations, and especially the perchloride, being used for this purpose. Nothing is worse than iron or better than turpentine.[1] Long strips of iodoform gauze may be wrung out in turpentine and lightly packed into the cavity, after which pressure may be made with a sponge and well-applied bandage. On the second day the packing may be removed.

Billroth relates a graphic case of this nature. A feeble young woman after confinement suffered from a succession of submammary abscesses for which numerous incisions had to be made. From one such incision made by Billroth blood welled up copiously as out of a spring. He stuffed the cavity and applied pressure. The blood displaced the dressings. He injected ice, and the hæmorrhage moderated. He was again hastily summoned because the bleeding had returned. The patient fainted, and passed from one fainting-fit into another. The bed flowed with blood and ice-cold water. The patient lay unconscious with upturned eyes, the nurses holding ammonia to the nose, and rubbing the forehead with Cologne water. Billroth adds that this was at the commencement of his surgical practice, and that "he should never forget the scene." Driven to desperation he meditated amputating the breast, when he bethought himself of turpentine. "I soaked a few wads with this substance, introduced them into the wound, and the bleeding was instantly arrested. The turpentine induced severe reaction in the cavity, granulations formed, and an ultimate cure resulted."[1]

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[1] See Jacobson, *The Operations of Surgery*, pp. 468-9 (footnote).

A married woman, aged twenty-six, was admitted into St. George's Hospital on 16th November 1877. She had an extensive mammary abscess following confinement. Several incisions had to be made, and from one of these sudden and profuse bleeding occurred. Plugging and pressure had to be resorted to before the hæmorrhage could be arrested.

A married woman, aged forty, mother of five children, was admitted into St. George's Hospital in April 1886. A year previously she had suffered from abscess of the left breast, which had "broken" at various intervals, leaving discharging sinuses. In the upper part of the left breast was a hard indurated mass, a little tender to the touch. The skin was marked by old cicatrices; the condition of the nipple was not noted, but there were no enlarged axillary glands. The surgeon of the week cut into the swelling and found an old abscess cavity surrounded by indurated tissue. This was drained, and a pad of salicylic wool applied. In the evening there occurred sudden and severe hæmorrhage. The house-surgeon again opened the wound, turned out a mass of clot, and re-dressed it. After this the case did well.

A rather unusual cause of death after opening a suppurating breast, is fat embolism. The case quoted below was reported in the *British Medical Journal* for 16th March 1895, by Surgeon-Major Fergusson of Bombay. The symptoms, however, might be explained by acute sepsis.

The patient, a healthy female of twenty-two years of age, came to the Civil Hospital, Shikarpur, on 7th April 1894, in great pain, and looking very much worn out by intense suffering. The left breast was enormously swollen, red, and exquisitely tender, with a doughy, elastic, semi-fluctuant feeling uniformly throughout. She was chloroformed, and a free incision was made in what appeared to be the most likely situation. There was great hæmorrhage, but only a small quantity of pus. The incision was made still freer and deeper, but still no collection of pus was reached. The finger was introduced and passed through the gland, which was spleen-like in consistence, and the finger could easily be pushed through it, but still only a small quantity of pus escaped, and it seemed equally distributed throughout the gland. A drainage-tube was inserted and a suitable dressing applied. The pain continued and the suffering seemed great. Morphine was given pretty freely, but she was very restless nevertheless.

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[1] *Surgical Pathology*, p. 40.

Next day she looked extremely anxious and worn out, and the breathing was laboured. The drainage-tube was removed, and some milky oily-looking fluid escaped with it. There had been a good deal of bleeding, but only slight purulent discharge. The dyspnœa rapidly increased, and at 5 P.M. it was noted that "the breathing is very much oppressed and 30 per minute, the face cyanosed, the pulse running, and patient unconscious." She died at 11 P.M.

Fat embolism was suspected, and a post-mortem examination was obtained almost by stealth, as the relations were outside "clamouring for the body." It was necessarily very superficial. The lungs were much congested, a great portion of the left approaching red hepatisation. Portions were kept and hardened. The kidneys could not be obtained, nor could the other organs be carefully examined under the circumstances. Sections of the lungs stained with perosmic acid and mounted in Farrant's solution were exhibited at the Calcutta Medical Congress; they show the capillaries and smaller blood-vessels blocked with oil-globules, which were present also in the blood in larger vessels.

CHAPTER III

CHRONIC MASTITIS

General remarks—Age—Question of cancer originating in chronic mastitis—Etiology—Connection with gout and syphilis—Gummatous mastitis—Mastitis after operations—Pathology—Frequency of cystic formations—Distinctions between chronic mastitis and fibro-adenoma—Symptoms and diagnosis—Neuralgia of breasts associated—Summary of clinical symptoms—Treatment—Operations for—Illustrative cases to show similarity to carcinoma—Mastitis round foreign bodies.

COMPARATIVELY little has been written in this country regarding the subject of chronic mastitis, yet there are perhaps few affections of the mammary gland of greater importance than are the varieties of chronic inflammation, few regarding which so many diagnostic difficulties constantly occur, and, we may add, none in which differences of pathological doctrines and histological appearances are more manifest. Jamain and Terrier, in the *Manuel de Pathologie et de Cliniques Chirurgicales*, 1889-1892, p. 698, observe that this disease is but little understood, and that its limitations are difficult to define. Excellent descriptions of the malady have been drawn among others by Koenig, Reclus, Castex, and Phocas.

Of the many questions of interest which suggest themselves in connection with chronic mastitis, none are of more importance than an inquiry into the amount of fibrous tissue which may be present in the breast in what may be called normal physiological states,—such conditions, for instance, as are characterised clinically to the observer, by tough lobulated areas of a firmish consistence, found in the mammary glands of women, who knowingly suffer from no pain or symptom of mammary disease whatever. It is surprising on carefully examining the mammæ of those women about the menopause, who have possessed pendulous and well-developed mammæ, how frequently areas of breast tissue, which feel firm or irregularly lobulated, may be detected. Just such areas, indeed, that if pain or local tenderness were complained of, would unhesitatingly be pronounced by most clinical observers to be due to chronic mastitis. The reflection is therefore raised in our minds that physiological conditions in the breast tissue may be confounded with chronic mastitis, and that the latter condition may occur with no very marked symptoms. When morbid growths, as carcinoma, occur in the breasts of women of mature age, who have normally abundant fibrous tissue in their mammary gland structures, an erroneous interpretation is put upon the facts by histological examination, the neoplasm not originating in a patch of chronic mastitis, but in degenerated gland epithelium surrounded by fibrous tissue, the result of normal processes. The formation of fibrous tissue is looked upon as due to chronic inflammation, and the latter as an important predisposing cause of true tumour formation. The tumour growth and the large association of fibrous tissue may be mere coincidence. Such questions must largely be settled on histological grounds, and afford scope for ample discussion and difference of opinion.

Most authors have applied the term chronic interstitial mastitis, to a clinical condition met with generally about the time of the menopause, during the period of involution of the breast. Personally, I have seen many marked cases of this affection in much younger women, although I am ready to admit that it is usually experienced in its more typical form at a late period of life.

H. B. Robinson, in vol. xlii. of the *Pathological Society's Transactions*, relates two cases occurring in single girls aged nineteen and twenty respectively. In both cases hard nodulated lumps were excised from the breast, and found to consist of dense connective tissue, embedded in which were numerous cysts. The rest of the breast tissue was healthy. The cysts contained a dirty brown fluid, and were lined with cubical epithelium. In some of the cysts was true intracystic growth. In these instances there was generally marked activity in the epithelium of the acini.

The transition from chronic mastitis into cancer is considered to be so common as to have received notice from almost every writer on surgical pathology. Clinically speaking, so soon as ever a distinct nodule is felt with the flat of the fingers in these cases, persistent increase is generally observed, and, if the nodule be not a cyst, carcinoma will probably be present. For my own part, I am inclined to the belief that many cases of cancer supposed to supervene upon chronic mastitis were cancerous from the beginning, and that no previous chronic inflammation existed at all. An early cancerous change is, doubtless, the spread of proliferating epithelial cells into the connective tissue, and this is marked by a hardness easily confounded with chronic inflammation.

It is not often that we have the opportunity of clinically examining cancer in its very earliest stage, but this is sometimes afforded in cancer of both breasts. A slight "induration," seldom a tumour, is discovered in the opposite mamma to the one first affected. We hope that this is a patch of chronic inflammation, but, as we watch, the progressive increase, the outlines of a definite tumour, force us to the conclusion that this is also cancerous, yet the commencement is indistinguishable from mastitis clinically. Time after time I have known the diagnosis made "of a patch of chronic induration" in these cases, when the latter has increased, and the diagnosis of carcinoma is at last forced upon the too confident observer. I would thus assert my belief that there are no clinical signs whereby we can certainly distinguish between a patch of induration from inflammation and very early cancerous infiltration; and some cases of carcinoma, said to originate in chronic inflammation, are really carcinomatous from the beginning, the hardness being cancerous, not inflammatory.

I believe I am right in stating, that clinical observation, of a continuous and accurate nature, can alone distinguish between early cancer and chronic mastitis. The former progressively increases, and week by week the characters of a hard, definite nodule become more developed, and this in spite of pressure, mercurials, and all other remedies. It is easy to see why confusion is common between a patch of mastitis and very early carcinoma. The two conditions being quite indistinguishable, it has been too readily assumed that cancer originates in chronic mastitis. That a considerable number of cases of carcinoma, originate in the scars of mammary abscesses and other definite lesions of an inflammatory nature, is quite undoubted.

There seems little doubt that some obscure relationship exists between chronic mastitis and uterine disorders, and this may be explained in many ways. Regarding this question, there are so many possible sources of error in observation that it behoves one to speak with much caution. It is a fact familiar to practitioners and obstetricians, that neuralgic pains and tenderness about the breasts, are very common in such affections as ovaritis and inflammatory enlargements of the uterus. It is only likely that if such patients suffer from chronic inflammatory affections of the mammæ, these symptoms will be intensified, and will call for recognition and examination. Thus it is rather my opinion that diseases of the uterus or ovaries may aggravate the symptoms of conditions in the breasts, which would never have been found had it not been for the uterine affection, which, rather than being the actual cause of the mammary affection, is merely the accidental exponent of it. In twelve cases of bad uterine fibroids, three of which were submitted to hysterectomy, there was no abnormal condition of the mammæ, excepting some general enlargement in three of the cases and exudation of serous fluid from the nipple on pressure. This latter phenomenon is, in my experience, found in many conditions of the pelvic genital organs associated with increased vascularity.

Etiology.—It has been assumed, with probability, that this curious affection is more common in single women, and in them it is certainly often associated with uterine and ovarian irritation, with scanty and painful menstruation. It has also been stated that blows, injuries, and the pressure of corsets are important determining causes. How far micro-organisms assist in the causation we can as yet only speculate.

The fact remains that in the breast, as in other organs, and notably the liver and kidneys, pathological knowledge of all the causes of fibrosis is not yet complete. Impediment to the escape of secretion by the ducts, by blockage or shrinkage, seems a very probable cause of enlargement, pain, and induration of certain lobules, and the almost invariable presence of cysts in chronic mastitis is very suggestive of duct obstruction.

R. Williams[1] has drawn attention to the important fact that gout may play a part in the causation of chronic mastitis. He speaks of the case of a stout, gouty clergyman, aged about fifty, both of whose breasts had been enlarged since youth, with painful nodular induration of the right breast, which he attributed to sub-acute gouty mastitis.

Irregular indurated areas are often relics of bygone acute mammary inflammations or abscess, the site of induration being occasionally marked by a scar. In such instances the women can generally afford a reliable history. In like manner the inflammations associated with traumatisms of all kinds may result in chronic indurations. Thus a hard mass of induration may long remain at the site of removal of a tumour, or after the opening of an abscess, and the diagnosis of cancerous growth, or of recurrence, is often erroneously made in such cases.

The transition between physiological engorgement and actual inflammatory exudation is very ill defined, and the one process may readily pass into the other. There can be no doubt that syphilis plays an important part in the causation of chronic mammary inflammations, though this was not noted by such accurate authors as Brodie or Astley Cooper. How many of these cases are due to the syphilitic virus, it is difficult to assure one's self. The evidences of syphilis in married women are exceedingly vague, and apt to be overlooked. There are few diagnostic signs, in the absence of actual gummatous disease or the effects of treatment, by which the point can be determined, and we doubt if the microscope would be able, in the absence of clinical evidence, to definitely settle the matter.

In the *Semaine Medicale de Paris* (17th January 1896) two remarkable allusions are made to syphilis affecting the breast. The first is by Beurmann. He showed his class a woman, aged fifty, who contracted syphilis from her husband at the age of twenty-two. Her breast was amputated four years ago for a tumour, and she now appeared with two similar growths close to the cicatrix. Beurmann describes two tumours, the one close to the scar, which was the size of an almond, involved the skin, and presented the appearance of the *peau d'orange.* It was as "hard as wood," and completely indolent. Close to the inner wall of the axilla was another similar, but smaller, rounded tumour. Before resorting to operation, a mixture of iodide of potassium and mercury was ordered, and in *six days* the tumours disappeared, this being very suggestive of their true nature, and also of the original tumour for which the breast was removed.

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[1] *Diseases of the Breast*, p. 109.

The second case was demonstrated by Emery, and the case was in Fournier's wards. The patient had previously suffered from a gumma of the vagina. Now an indurated nodule formed in the mammary gland, which developed with unusual rapidity, attaining the size of a Tangerine orange in a few weeks. The tumour softened, broke down, discharged a central slough, and rapidly healed under iodides. Emery considers that gummata of the mamma are not especially rare, though Claude, in a thesis published in 1886, could only collect twenty-three authentic cases. He had observed retraction of the nipple and adherent skin in some of these.

Lang[1] relates a case of severe syphilis in a woman aged twenty-nine, with deep gummatous ulcers on the neck. The right breast became swollen and painful with a swelling the size of an egg, connected towards the periphery of the gland with thickened acini. By mercurial inunction and large doses of the iodide of potassium, the swelling of the breast quite disappeared, together with other prominent syphilitic symptoms. It is worthy of note that the left parotid gland was also swollen and tender.

Berkeley Hill, in his work on syphilis, quotes a series of cases of gummata of the breast from the practice of Verneuil, Velpeau, Richet, Lancereaux, and others. In all the cases collected by Hill the usual characters of gummata were noted. The swellings had a tendency to soften in the centre, with a faint red blush on the skin. Later circular sores formed, with a gray slough at the bottom. Amenability to treatment by the iodides was always very marked.

Of syphilis affecting the breast in the chronic fibrotic form, which especially interests us here, but few instances have been noted. Hill quotes the case of a woman, aged twenty-four, who came under treatment in January 1864 with a papular syphilide, mucous patches, and iritis. About three months after, the right mamma became enlarged, hard, and painful; under the administration of iodides the patient was cured in seven days. He quotes another case from Ambrosoli of a like nature, when, soon after the appearance of the skin-rash, a firm, diffuse swelling appeared in the breast, which disappeared under iodides.[2]

"The progressive softening of a gumma," writes Bryant, "in whatever gland or tissue it may be found, is a characteristic symptom of the affection." This author alludes to the analogy between syphilitic affections of the breast and testis, and the point is an admirable one for the "gummatous" testis, with a tendency to slough centrally, and the chronic indurated enlargement of diffuse syphilitic processes are pathologically similar to like affections of the mamma.

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[1] *London Med. Record,* 15th June 1880.

[2] *Syphilis and Local Contagious Disorders,* p. 309.

Bryant also relates the following highly instructive case:—

A married woman, aged forty-six, who was childless and had had no miscarriage, consulted him for an infiltration of the upper lobe of the left breast, which had been coming on for eight or ten months. The skin over it was natural, but she had a suppurating node over the frontal bone. The breast increased in size until it was as large as a cocoa-nut, but the external signs of inflammation were obvious. About twelve months afterwards the whole mass sloughed out, and the deep wound healed.[1]

A spare, married woman, aged thirty, of very dark complexion, came to the Waterloo Bridge Hospital on 27th May 1895. There was a hard and slightly tender lump the size of a Tangerine orange, close to the axillary side of the right nipple. The nipple was a little retracted; the skin was not adherent. There were no enlarged axillary glands. The woman stated that the swelling had existed for about two months, but it may have been longer. The tumour was not movable, and the skin over the centre of it was a little dusky in colour and inflamed. The centre of the tumour was elastic, tender on pressure. There were no similar swellings elsewhere. The woman has been married for six years and has had one child, now five years old. No miscarriages. The tongue was fissured, with suspicious spots of white thickened epithelium at the sides. There were some plaques and fissures on the lips. 10th June.—After a fortnight's course of potassium iodide and mercury, the lump in the breast has entirely gone. No local measures have been adopted. One can hardly doubt but that it was a gumma. January 1896.—I communicated with this patient, and she replies me that she still "remains" perfectly well.

In the chapter on diseases of the male breast, instances will be quoted of chronic inflammation affecting this organ, probably of a syphilitic nature.

Knotty lumps, or areas of indurated tissues, may long persist in the breasts of those women who have suffered from the ordinary troubles associated with lactation and inflammation, or from definite abscess. It is probably quite unknown how frequent these are, or how many women bear all their lives some such patch of indurated mammary tissue. There is this very important characteristic associated with such old inflammatory foci. They are in my experience seldom the seat of the severe neuralgic pains and troubles found in other varieties of chronic inflammation of the breast. If they do become painful and definitely increase, there is generally some urgent reason for this, which needs prompt recognition. Either a fresh abscess is about to arise in the old inflammatory focus, or a definite tumour, probably cancerous, is in course of formation.

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[1] *Diseases of the Breast*, p. 72.

The history, too, of this class of cases of chronic inflammation is usually pretty sure and distinct.

The scar of an old incision or healed sinus will be obvious, the nipple is frequently retracted, and the woman will herself furnish a reliable history of "gathered" breast, of inability to suckle, and of bygone swellings and inflammations, or of incisions made for the evacuation of pus.

In the chapter on mammary abscess will be found several instances of abscesses occurring late in life in these cases, and there can be little doubt that in the old inflammatory foci, pyogenic organisms may lie latent for periods at present beyond our calculation or control.

Attention must strongly be drawn to the all-important point, that operations upon the breast, especially if they involve the glandular tissue itself, are very apt to be followed by swelling and induration. If unfortunately such operations become septic and suppurate freely, the resulting induration and swelling may be very considerable. I have seen this occur on several occasions after removal of adenomatous tumours, and the resulting mass of indurated tissue rendered it difficult not to believe that a recurrent growth was forming in the site of the old tumour. The moral of this important consideration is obvious, and the surgeon must not jump at the conclusion too hastily, that a tumour is recurring because hardness is felt in the site of the operation scar. These indurations are peculiarly amenable to pressure, which may be used in a diagnostic as well as a curative sense.

In treating of mammary abscess the subject of tuberculous disease has received notice. Abscess, caseating and softening foci, are common in this disease, yet the phenomena of it may closely resemble chronic mastitis. This is well shown in a specimen preserved in the museum of St. Thomas's Hospital (2510 A). The appearance of the breast is that of the ordinary chronic interstitial mastitis, but at one spot is a caseating focus the size of a filbert, which was tuberculous. Such cases remind us of chronic fibrosis of the lungs in association with tubercle, and this important specimen enables us to speak of chronic tuberculous mastitis. Such cases might easily be overlooked in practice, and are possibly more common than is yet known.

Pathology. — The pathological changes, which occur in chronic mastitis, though diverse and complex, are well known: but, as has been already shown, the relation of the process to tumour growth is very difficult to determine, and various estimates as to the connection between hard carcinoma and chronic mastitis are held by different authors. The process essentially consists of a chronic inflammation associated with the formation of fibrous tissue, which is always in typical specimens very sparsely nucleated. The fibrous tissue is abundant, especially round the ducts, which are generally morbidly dilated in some parts, atrophic and flattened in others. The glandular structures and fat are surrounded by the newly-formed tissue which may compress and cause

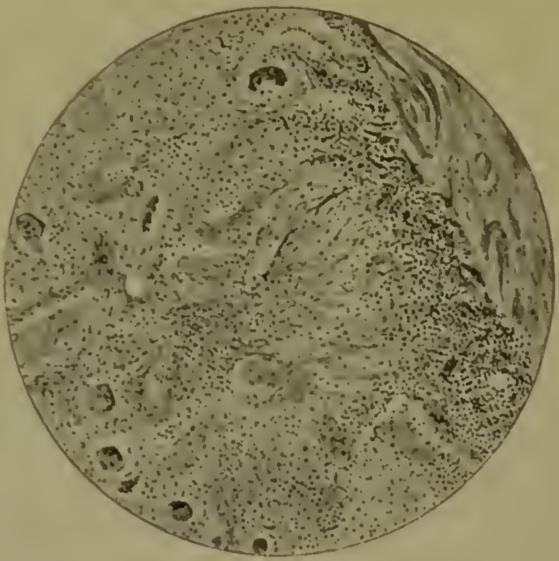

FIG. 15.—Chronic tuberculous mastitis. At the lower part of the figure "giant cells" are seen, and the abundant fibrous tissue is mingled with a small-celled growth.

atrophy of the epithelium. The lobe or lobule of the breast thus affected, is not separated by any distinct capsule or line of demarcation from the surrounding breast tissue, but fades away gradually into it by knotty indurations and irregular areas of tough tissue.

The nipple may be drawn inwards by contracting fibrous tissue, and the skin may also be puckered by the sinus of an old and perhaps forgotten suppuration. Furthermore, owing to pressure and obstruction of the ducts, cysts are very apt to form in chronic mastitis. These may vary from the size of a walnut down to microscopical dimensions. They are usually simple retention cysts, lined internally by smooth epithelium, and filled with straw-coloured serum, or slightly bloody fluid, if there be associated intracystic growth. Both mammæ may be affected, and the axillary glands are sometimes enlarged, and are nearly always tender. Intracystic papillary growths are generally absent in the retention cysts of chronic mastitis, or if present, are confined to one or more small vegetations. Areas of chronic inflammation are generally scattered about the breast irregularly, and are seldom uniform in arrangement or single, but the cysts may be so numerous as to "riddle" the mamma with cavities.[1]

My colleague, Dr. Rolleston, who has examined a large number of specimens of chronic mastitis, makes the following important distinctions between the chronic inflammatory process, and that of the tumour known as fibro-adenoma, with which, pathologically and clinically, it is too often confounded:—

(1) The fibrous tissue is usually very well formed and dense. It is often exactly like old-scar tissue. Occasionally it becomes swollen and œdematous, and resembles myxomatous tissue.

(2) This fibrous tissue differs from that found in a fibro-adenoma of the breast in enclosing and surrounding the interstitial fat of the breast. A fibro-adenoma being an innocent tumour, displaces and pushes aside the other constituents of the mamma.

(3) The gland tubes enclosed in this fibrous tissue are atrophied and compressed. Groups of atrophied tubes, the

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[1] In the chapter on cysts of the mamma an illustration will be found of this affection (Fig. 34).

individuals of which are separated by but little interstitial tissue from each other, occur at considerable intervals.

In fibro-adenoma the newly formed tubes are much more freely distributed.

(4) The atrophied tubules in chronic interstitial mastitis do not show the tendency to general cystic dilatation that is commonly seen in fibro-adenoma.

Retention cysts (due to localised dilatation of ducts) frequently occur in chronic interstitial mastitis. The cysts are large and not accompanied by a general microscopic dilatation of the tubules.

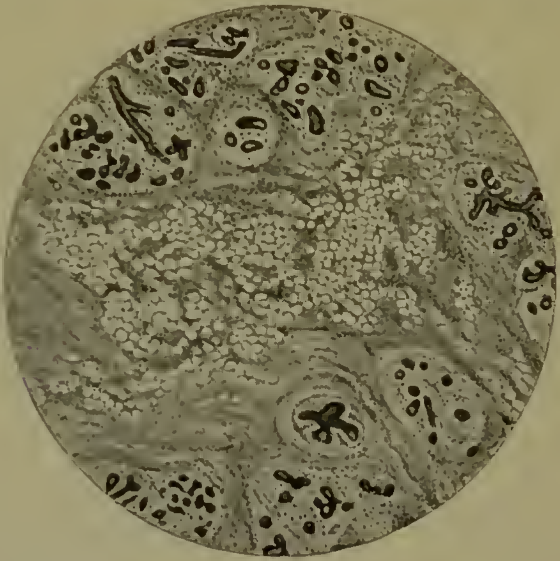

FIG. 16.—Chronic interstitial mastitis. The fibrous tissue surrounds fat and breast-tissue—it does not displace it.

(5) Carcinoma may start in chronic interstitial mastitis, and extensively invade the fibrosed mamma.

(6) Chronic interstitial mastitis rarely passes into sarcoma.

I question whether the histological characters of chronic interstitial mastitis, and its more important differences from fibro-adenoma, have ever been more clearly enunciated. It is important that the distinctions between these affections should be clear. Even now, a mass of chronic interstitial mastitis is often called "adenoma."

An excellent account of the histological characters of a case of chronic mastitis is given by M. Poujol in the *Archives de Médecine Expérimentale* for May 1897. He draws especial attention to the morbid dilatation of the ducts, which were filled with degenerated epithelium, expressed in the form of casts on pressure. He attributes the dilatation to this morbid secretion and to the fibrous retraction on the exterior of the ducts.

To make a general statement founded on the examination of many specimens of chronic mastitis, I would say that the observer must be prepared to see fibrous tissue in all stages of development, even in the same specimen, and hence the appearance of one part of an induration may be notable by reason of scattered cells and nuclei, and another may be quite indistinguishable from well-formed scar tissue. I believe I am justified in stating also that the epithelium of the acini and tubules is often in a state of morbid proliferation, easily confounded with early carcinoma and difficult to differentiate from it. The microscopical diagnosis of carcinoma in such cases must be given with the extremes of caution. In no branch of morbid histology are mistakes more commonly committed by too confident observers than in this.

A study here becomes at once apparent, of the important question, as to how far changes closely resembling or indistinguishable from chronic mastitis occur in the breasts of the aged, or in functionless mammæ. In some old women the breast tissue is represented merely by fibrous tissue, all trace of gland substance having disappeared. This was the case in a series of specimens from two women over seventy years of age, kindly examined for me by Dr. Buckmaster in 1894. In other cases scarcely anything but fatty tissue could be observed.

It would be exceedingly difficult for any accurate histologist, to distinguish between a section of old chronic mastitis, and the fibroid transformation of mammary tissue sometimes so apparent in the aged. The atrophy and disappearance of the glandular elements of the breast in aged women are, however, more complete than is the case from the pressure atrophy of chronic mastitis.

So far as I have been able to observe from the examination of a considerable number of specimens, the section of what

I may term physiological fibrosis of the breast, where the fibrous tissue is merely apparent from atrophy of the gland elements and fat, is marked by almost total absence of nucleation. This condition of fibrosis may come on in comparatively young women, the breast as it were becoming prematurely old.

Symptoms and Diagnosis.—For clinical purposes we may well follow the description of Jamain and Terrier, and classify cases of chronic mastitis into circumscribed and diffused. A woman about the menopause will discover a lump in her breast, her attention is drawn to it usually by pain of a neuralgic nature, or local tenderness. The greatest alarm is naturally created, and the aid of the medical attendant is sought as to the true nature of the case. Perhaps there are few diagnostic matters more difficult to certainly answer, assuredly there are none of such vital importance. An easy, but very wrong, way is too commonly found out of the difficulty by counselling the removal of all mammary glands which are what is termed "suspicious," or in plain terms, in which the diagnosis is difficult. The resemblance to hard cancer may be so close as to render diagnostic error unavoidable. At the same time, there are certain points of importance which, if carefully attended to, may prove of invaluable aid in coming to a correct decision. I must confess to having seldom personally recognised the circumscribed variety of chronic mammary inflammation spoken of by the French and other authors. As may be expected from the very nature of chronic inflammation, the process is not as a rule equally advanced in the whole of the affected area, and even in a part which seems circumscribed there are adjacent lobes and lobules unduly hard, and obviously affected, the process "shading off" imperceptibly into indurated breast tissue. Indeed, I would go so far as to say, that if a surgeon finds in a breast a tumour which presents a definite, circumscribed outline to the pressure of the fingers laid flat upon it, such a formation will, in nine times out of ten, be something more than simple chronic inflammation. It may prove to be a cyst, a chronic abscess, a carcinomatous deposit, or a true fibro-adenoma. That there are degrees of chronic mastitis no one will deny, and the process differs in extent remarkably.

Thus both breasts may be affected or only one. The inflammatory process may be limited to one area of the breast or scattered irregularly about it. The breasts are usually the seat of uneasy sensations, pains, and aches, worse at the menstrual epochs, and often harassing the patient night and day with the fears and terrors of cancer. When the process occurs in younger women the pains are usually of a severe neuralgic nature, acute about the exits and distribution of the lateral cutaneous twigs of the intercostal nerves, and notably increased at the menstrual periods. But every practical surgeon knows, that the amount of pain in cases of a small chronic induration of the breast, varies exceedingly in different individuals. Thus one woman will actually faint on examination, while another will complain of but slight uneasiness on manipulation of the affected part.

In the neuralgia associated with the menstrual periods the breasts are hard, tense, erectile, the patients young, stout, flushed, and plethoric. There are tender spots scattered through the breast, and the superficial veins are turgid. Purgation, by the abstraction of blood by leeches, and the administration of the salicylates internally, is advisable in such cases as these, and galvanism applied locally should never be omitted. I have seen strikingly good results from it.

In neuralgia associated with chronic mastitis the women are as remarkably pale and anæmic, as though they were losing blood by the rectum or from a uterine growth. Their breasts will be knotty and hard. The pain is both localised and diffuse, and especially tender at certain spots and points. Sometimes a small painful subcutaneous tumour may be made out. The radiating pains spread down the arms and round the chest into the axilla and neck. The fear of cancer is usually strongly marked. In the treatment of these cases, it is most important to detect and remove any small adenomatous tumour, or distinct localised lobular induration, the seat of tenderness and pain. I would venture to especially dwell upon the association of anæmia with chronic mastitis. In marked cases of the disease the patients are often far more white and "anxious-looking" than is the case in carcinoma.

The comparative frequency of chronic mastitis in married and single women is difficult to compute. Authors differ exceedingly on this point. In twenty-eight cases observed by myself the preponderance was on the side of married women who had borne children, and who had been subject to all the sources of inflammation which lactation affords. In single women, a patch of chronic inflammation in the breast is usually associated with so much pain, that it comes under medical observation. A married woman, on the contrary, may carry an indurated area of breast tissue, the result of old acute mastitis or abscess without complaint for years. Such questions as these are almost impossible to answer with accuracy, and the time and energy bestowed upon them may perhaps be better employed.

From what has been said, the reader will have gathered that retraction of the nipple may be associated with mastitis. In cases of old suppuration puckering of the skin may also be found. Little is to be learned from the condition of the axillary glands which are enlarged slightly, and tender on pressure.

Tenderness, too, is almost universally felt in the mass itself, and it lacks the definite hardness of carcinoma. On taking up the gland between the fingers and thumb a definite tumour is felt, but this disappears if the hand and fingers be placed flat against the mamma, compressing the gland upon the thorax. Should a cyst be developed, a chronic abscess exist, or a commencing cancerous growth, this will at once be felt against the flat fingers as a swelling with definite margins, of small size perhaps, but differing markedly from the dimensions of the tumour appreciated in manipulating the breast between the fingers and thumb.

The symptoms of chronic diffuse mastitis are thus well summed up by Jamain and Terrier.[1] The affection presents itself "sometimes unilateral, sometimes bilateral, but then more marked on one side than the other. When the parts about the nipple are taken between the fingers, a tumour, more or less voluminous and unequal, seems to occupy the whole of the gland. When, on the contrary, the tumour is examined from in front and behind, and one presses the nipple with the flat hand against the thorax, the tumour disappears. But then one may feel many parts of the gland indurated, but less hard than scirrhus, also more limited, and less sensitive on pressure. Also one finds in the remainder of the gland small nodosities, fixed and rounded. The feeling resembles a fatty mass of tissue, with the glandular lobules in the centre injected with suet." The authors go on to point out that the whole breast may become painful, and that a watery fluid resembling milk may be secreted.

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[1] *Manuel de Pathologie et de Clinique Chirurgicale*, tome quatrième, p. 700.

Chronic mastitis is of such extreme importance from a clinical point of view, that the following summary of its leading local characteristics drawn up with a view to simplicity, may prove of service to the practitioner, for cases of this nature will not infrequently present themselves, and give rise to great diagnostic difficulties :—

(1) Manipulation of the mamma with the flat hand presents no tumour with definite, circumscribed boundaries, unless a cyst, or a carcinomatous or fibro-adenomatous growth has formed as well.

(2) Manipulation between the fingers and thumb detects areas of indurated tissue feeling exactly like tumours, which are often multiple, found in both breasts, and shade off imperceptibly into firm granular breast tissue.

(3) Tenderness on pressure is common, but its degree varies. The axillary glands are often tender.

(4) Retraction of the nipple, or puckering of the skin may be found in these cases, especially when there is a past history of acute mastitis, the shrivelling of a cyst, or the scar of an old abscess.[1]

(5) It may be impossible to distinguish between early cancerous change and mastitis, and in such instances it is advisable to apply treatment, and watch the progress of the case.

Bryant believes that the peculiar dimpled condition of the skin seen over carcinoma is never found in inflammatory affections or simple tumours.[2] Doubtless he is right in the great majority of cases. Castex[1] relates a case of circumscribed mastitis where coarse pitting of the skin was present, and thus, as usual, exceptions may be found to every rule. Personally, I have never seen this appearance, except in connection with hard carcinoma, or after a healing sinus.

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[1] "L'aspect 'peau d'orange' n'est pas exclusif aux tumeurs malignes, mais on ne le rencontre guere dans les abces chroniques" (Jamain and Terrier).

[2] *Diseases of the Breast*, p. 174.

It has been already pointed out that a certain number of cases of chronic mammary inflammation are due to syphilitic processes. The "gummatous" variety is tolerably well marked, but it is difficult to speak positively of diffuse syphilitic fibrosis, and I know of no distinguishing marks of syphilitic mastitis of a more chronic nature, unless it be the presence of other marks or signs of the disease, but I have stated my belief that syphilis is a more common cause of chronic mammary inflammation than is generally believed or recognised.

Treatment.—Many cases of chronic mastitis will disappear or become markedly better under the combined effects of pressure and mercurials, with the iodides internally. This treatment is, to a certain extent, diagnostic also. The breast is covered with a layer of lint smeared with the blue ointment, and a hole is cut in the centre for the protrusion of the nipple. Over the whole is placed a layer of cotton wool with a firm "breast-bandage," applied from below upwards, after a "spica" fashion. If the bandage is made of a slightly elastic material, so much the better. This dressing should be applied with a good deal of care and pains, and the bandage altered in tightness according to the sensations of the patient. If inflammation of the delicate skin over the breast, should occur from the mercurial, the ointment must be diluted. The green iodide of mercury ointment largely diluted with lanoline is very valuable. A mixture containing the iodides of sodium and potassium, with two minims of free iodine, and a little nux vomica, may be given thrice daily after meals, largely diluted with water. In ten days to a fortnight a very decided alteration should occur in the size and consistence of the diseased part, and should this favourable circumstance arise, a perseverance in the same plan will probably lead to complete disappearance. On the other hand, cases will be met with where little or no change is produced, or where indeed definite increase is observed.

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[1] *Revue de Chirurgie*, 1887.

In the latter case, there can be little doubt but that the enlargement is due to something more than mere inflammatory changes; it is equally evident that we have to do with a condition productive of constant irritation in the breast, which the clinical experience of eminent surgeons has led them to believe is followed by the development of carcinoma in a significant number of cases. In such conditions, removal of the entire breast is indicated, and the urgency for this operation becomes the greater as the patient approaches the menopause. At that period such treatment is very imperative.

It may be pointed out that repeated blistering over a painful and hyperæsthetic nodule of indurated breast tissue often gives striking relief in cases of mastitis.

A careful surgeon will remember that all causes of pelvic irritation must be considered and treated in connection with cases of chronic mastitis, and any evidence of syphilis will be carefully investigated. The carbonate of iron is very beneficial in certain cases of anæmia, and I know of no remedy which acts more markedly for good in cases where neuralgia is a prominent symptom.

In a considerable number of cases of chronic mastitis, the areas of induration will resist treatment by blistering pressure and the like. Then the inevitable question will have to be solved as to what next is to be done. Abundant differences of opinion are found in these vexatious and difficult circumstances, and I can only here promulgate the rules of practice I have usually followed myself.

(1) In young women under the age of thirty and in girls I would steadily persevere in the application of anodyne remedies locally, with the internal administrations of iron, arsenic, quinine, and general tonic remedies. Change of air to bracing climates and sea-bathing are also indicated. Time will not uncommonly work wonders in these cases, and galvanism with pretty severe blistering over neuralgic areas as remedial measures of importance should never be lost sight of.

(2) The definite hard area around an old mammary sinus had better be excised if it resists pressure and mercurials.

(3) In elderly women, where the appearance and possession of the breast is of less importance, I would always counsel excision of an affected area of obstinate mammary induration, and if this be at all extensive or scattered, I would strongly advise the removal of the whole breast. This opinion would be strengthened should cysts also be numerous. If partial excision be performed in these cases, small cysts are left behind, which are apt to subsequently develop and become prominent.

(4) The process is commonly bilateral, and the operative treatment above sketched must be applied to both mammæ if need be.

The operation for removal of an indurated portion of mammary tissue must be conducted with the most strict and elaborate aseptic precautions. No cases are more likely to do badly if any septic element be introduced, and generally speaking, such operations will give more trouble in the healing process than removal of the entire breast. The patient should never be told that the operation is "trivial" or a "mere nothing." An incision should be made radiating from the nipple, and the affected area removed by cutting well into healthy breast tissue around. The surgeon should aim at removing a wedge-shaped portion of mammary tissue. The greatest care and pains should now be taken to arrest all bleeding by fine ligatures, forcipressure, and flushing with hot perchloride of mercury lotion (1 in 1000). The arrest of bleeding in these cases is far from easy, since the vessels retract into the tough breast tissue, and are divided at a considerable depth. If the wound be hastily and superficially united, it fills with clot and rapid union is entirely prevented. The sutures should be passed very deeply. Great care should be taken to introduce a drainage tube into the deepest recess of the wound, and to bring it out in a dependent position. The tube may generally be removed in twenty-four hours. Coaptation of the lower parts of the cavity may be brought about by appropriately passing fishing-gut sutures, but I have lately used with advantage in several of these cases buried sutures of fine chromicised gut. They are passed with a curved needle round the tissues in the deeper parts of the wound, are drawn firmly, tied, and cut off, after the fashion of a purse-string suture. Finally, a careful suture of the cut skin should invariably be carried out to promote universal union and obviate scars. My experience of a considerable number of these cases has taught me that unless painstaking precautions of this kind are carried out, very unsatisfactory results may ensue from removal of portions of breast tissue. The following case illustrates the treatment of mastitis by excision, and also shows how difficult these cases are to keep perfectly aseptic, and to ensure speedy union.

A married woman, aged twenty-nine, was admitted into St. George's Hospital on 18th March 1896, under my care. Patient had a child seven years ago. There was then nothing wrong with the breasts. Two years ago she received a blow upon the right breast and it has been swollen and painful since, and especially worse at the menstrual periods. The mamma towards the axillary margin was hard and indurated, and excessively painful to the touch. There was no distinct tumour, the skin was free, and the nipple not retracted. The axillary glands were a little enlarged and tender. Blistering, pressure, and anodynes were previously tried without avail. On the 18th March a wedge-shaped portion of the mamma was removed including the whole of the axillary cusp. The most careful asepsis was employed, but an error crept in somewhere and this case did not do well. The patient had an irregular temperature, and the wound suppurated slightly in two places. On the 15th April, a small superficial abscess was opened near the nipple. The pus contained the staphylococcus aureus in abundance. By dint of careful dressing and support on the part of the house-surgeon, Mr. Trethewey, the wound healed soundly, and I saw the patient three months after quite well and free from local pain or discomfort. The portion of the breast removed was examined, and consisted entirely of firm fibrous tissue surrounding atrophied tubules. Very elaborate care was taken in the performance of this operation, but I believe the infection occurred from the skin of the axilla, a region very difficult to render perfectly aseptic. It is also possible that pyogenic organisms already existed in the mammary tissues.

In all cases of mastitis very careful regulation should be made of the shape and pressure of the corset. Friction and irregular pressure of badly-fitting "stays" has much to do with aggravating the symptoms.

M. Tripier makes use of a double system of suture and drainage in these cases. I have employed his method and think highly of it. The wedge-shaped area being removed, the deeper parts are united by fine catgut sutures and a drain is brought out inferiorly. The superficial margins and skin are now united, and a drain also placed subcutaneously. Thus adaptation of the entire cut surfaces, with free drainage, is provided for. I used the finest silk, boiled and soaked in carbolic lotion, for the cases in which I have adopted this excellent plan.

The following illustrative cases will well bear perusal, in connection with the previous remarks.

Irregular Swellings in Left Breast of a Single Woman aged thirty-one. Disappearance under Blistering, Iodides, and Pressure.—The patient, a pale anæmic woman, came to the out-patient department at St. George's Hospital on 12th January 1895. She has noticed a swelling in the right breast for four months, with some shooting pains and much local tenderness, especially on manipulation. An irregular, somewhat indurated mass of tissue the size of a half-crown is to be felt in the upper quadrant of the right breast. The skin over it is quite unaffected, and it fades gradually into surrounding breast tissue. Near the nipple is a smaller swelling of like nature, connected with the other by a tract of indurated tissue. The nipple is not retracted, but the axillary glands are a little evident. The left breast is normal. A marked feature in this case was the excessive tenderness on handling—at the menstrual periods the patient could hardly bear the pressure of the clothes upon the affected breast. The swellings were painted twice weekly with the ethereal tincture of cantharides, and an aperient iron mixture was given internally. After fourteen days the parts were covered with a mercurial plaster, and firm pressure was applied with a breast-bandage. This treatment was continued for about a month, and at the end of that time the indurated patches had almost disappeared, while the iron had greatly improved the patient's general condition.

Chronic Interstitial Mastitis of both Breasts simulating Cancer. Improvement under Mercurials and Pressure, with large Doses of Iron.—A single lady, aged forty-one, was brought to me in January 1893, by Dr. Norton of Queen Anne's Mansions, with an affection of both breasts. I was told they had been pronounced to be cancerous by a hospital surgeon. She was thin, haggard, and pale, and had been losing flesh. She had suffered from very severe shooting pains in both breasts, and three months before I saw her had developed "lumps," which she discovered from their painfulness, in both mammæ. There was no family history of carcinoma. The skin was not affected, but both nipples were retracted. Very obvious hard tumours could be detected in both breasts, but on feeling the affected area with the "flat of the fingers" the tumours could not definitely be made out, the hardness disappearing. Marked symptoms in this case were the tenderness and hyperæsthesia on manipulation, which, I have often observed, are not usual in early cancer. There were enlarged glands in both axillæ. I was in complete doubt of the true nature of this case, and suggested a month's trial of mercurials with pressure. The carbonate of iron was administered internally, and the breasts covered with the plaster of mercury with ammoniacum. They were kept well bandaged. I saw this patient again on 13th March. Her condition had steadily improved, and on examining I found only ill-defined thickening, the hardness having quite disappeared; the mammæ were flaccid, and even on "pinching up" portions no distinct tumours could be felt. A further course of iron was ordered. In January 1896 I wrote for particulars regarding this patient, and heard that she remained perfectly well.

A similar case, but far more difficult to express an opinion upon, was as follows:—

On 23rd July 1896, I saw, through the kindness of Mr. H. Cripps, a single lady, spare, nervous, and remarkably anæmic and bloodless. She gave the following history. Her father had died of cancer of the throat, and her brother had a tumour (fibro-adenoma?) removed from the right breast ten years before. She had lived much in India, and the condition of her breasts was there discovered twelve months ago. She had suffered greatly from gout, which is a family complaint. This is evidenced by pains in the limbs, and enlargements of the knuckles. Both breasts were found to contain "lumps," and she came to England and was operated upon by a hospital surgeon. He removed a tumour from near the axillary margin of the right mamma, the scar of which still remains. He told her that it was "breast tissue," and that she need not be nervous. On examination, both breasts, especially the left, are "lumpy," and irregularly indurated and coarsely granular. The skin and nipple were free. There were no enlarged glands. The breasts were tender, voluminous, and in some parts intensely hyperæsthetic. The hardness and induration seemed to culminate just above the nipples. On the left side especially, an irregular area could be felt with the flat fingers, which seemed to give one the idea of cysts, or some separate growth. Many diverse opinions had, as usual, been expressed.

I advised that, seeing her age, and the possibility of early carcinomatous change having set in, the left mamma should be removed, and submitted to expert naked-eye and microscopical examination. Should any dangerous appearances of the epithelium exist, that then the other breast should be removed also. This treatment was carried out. The only report I was able to obtain regarding the specimen was to the effect that it was typical of chronic mastitis and full of cysts.

Chronic Mastitis following Removal of Adenoma of Breast, leading to Suspicion of Recurrent Tumour and Amputation.—A single woman, aged forty-six, was admitted into St. George's Hospital on 9th June 1892. Three months before she was an inmate, and then an undoubted fibro-adenomatous tumour was removed from the right breast. Now in the scar of the former operation is a hardening and slight redness, the little mass being adherent to the skin. On 10th June the whole breast was removed, and the area of indurated tissue was carefully examined by Dr. Rolleston. He reported that it was "chronic interstitial mastitis."

The last case is a typical instance to prove how easily the chronic inflammation in an operation area may be taken for actual recurrence of a growth.

Case of Removal of Breast for Chronic Mastitis and Retention Cysts.—A. H., aged forty, admitted into University College Hospital, 17th January 1882. According to her account the right mamma had previously been removed for "cancer." Immediately after the operation the left breast began to be painful, and caused her great annoyance. The breast was noted to be larger than normal; it was indurated and knotty. It was not very tender when handled, but was the seat of much pain. As the patient was single and treatment produced no effect, the breast was removed. General chronic interstitial inflammation was found, with numerous cysts. "The cysts are dilated acini, distended by secretion in consequence of the pressure of newly-formed connective tissue upon the ducts."[1]

Chronic Mastitis cured by Pressure.—A married woman, aged forty-three, was admitted into St. George's Hospital in July 1878. Three months before admission she experienced pain and aching in the right breast, and the nipple became retracted. Soon she noticed some hardness in the gland, and the pain became worse. Menstruation was irregular, and her last child was born two years before. The upper half of the left breast is described as hard, nodulated, and rather tender. The nipple was retracted but the skin was not implicated. The remainder of the gland was soft. There was one enlarged gland in the axilla. Under pressure and belladonna the swelling and pain got less. Thus by 4th August a note was made to the effect that the hardness and induration was much less and that the axillary gland was hardly perceptible. About this time it was noted that the nipple of the right breast was becoming retracted, and there was slight serous oozing from it. By 10th August it was noted that the hardness of the left breast was rapidly disappearing, while that of the right was becoming more pronounced. The right breast was now treated by strapping and pressure. In September the patient was discharged as cured, the mammæ having assumed their healthy condition. There is no note as to whether the nipple became again prominent.

Mastitis with Nodules simulating Tumours. Spontaneous Disappearance.—A dressmaker, aged thirty-eight, tall, thin, very nervous and anæmic, of spare frame and with flaccid mammæ, saw me on 21st November 1895, complaining of tumours in both breasts. She has had the tumour on the right side for two years, that on the left for five years, and the latter has never given her trouble. The lump on the right side has, however, been very painful and tender, especially during the menstrual periods. The tumour in the right breast is exactly like a hazel-nut in form and shape. It is situated deeply in the breast, and is very movable. The tumour in the left breast is the size and shape of a filbert, and is close to the axillary margin of the breast. There is a sensation as of other tumours; the patient declares that her "breasts are full of them." On examining with the "flat of the fingers," it is obvious that one feels the indurated lobules of chronic mastitis, which are closely associated with the tumours above described. The nipples were not retracted. The skin was free; there were no axillary glands enlarged. The patient refused surgical interference, and was treated with iron and quinine, the case being merely watched. By June 1896 a surprising alteration had spontaneously taken place. The indurated lobules of mammary tissue had become soft, and the tumour in the left breast had entirely disappeared. Careful notes were kept of the case, and there could be no doubt regarding this observation. The tumour of the right breast was as evident as before. This case was kept under close observation for many months.

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[1] *Catalogue of Univ. Coll. Hosp. Museum*, p. 438.

Chronic Mastitis in a Girl aged twenty-five.—A pale, anæmic servant, overworked, badly fed, and who menstruated feebly and painfully, was admitted into St. George's Hospital on 11th October 1895. For about two years she had noticed a painful "lump" in the right breast. The pain is described as "shooting," "darting," and is always much worse at the menstrual times. An ill-defined tumour, the size of a large filbert, could be detected in the axillary portion of the right mamma. On examining this formation with the fingers "placed flat" upon it, the tumour is not distinctly to be appreciated, whereas it is very plainly to be made out on taking the part between the finger and thumb. The nipple and skin are unaffected, but the axillary glands are slightly enlarged. The swelling is excessively tender and painful on manipulation. The portion of diseased mamma was excised by Mr. Haward. Dr. Rolleston examined the specimen, and I also had an opportunity of seeing the microscopical appearances. The disease was chronic mastitis with abundant formation of fibrous tissue. It may be mentioned that on fresh section many small cysts of the size of buck-shot were scattered about.

Chronic Mastitis simulating Cancer.—M. H., thirty-eight, married, six children, was admitted into St. George's Hospital on 26th July 1877. Fourteen years ago an abscess formed in her right breast. She remained quite well until three months ago, when some pricking pain occurred about the wound. The central portion of the right breast was hard and nodulated, the nipple deeply retracted, and the skin very adherent. The swelling was rather tender on pressure, and there was severe "shooting" pain, especially at nights. The glands in the axilla were not enlarged. There was a slight serous, yellow discharge from the nipple.

The opinions regarding this case were very variable, but ultimately it was decided to strap the breast with a mercurial and belladonna plaster, and to administer iodides. Week by week the swelling got softer and smaller, and the last note made of the case was to the effect that the tumours had nearly gone. The pressure treatment lasted for over a month.

In concluding the subject of chronic mastitis the possibility of an indurated mass in the breast being due to the irritation of a foreign body must not be overlooked. Curiously enough such substances as pins and needles have gained access to the breast, without the patient being at all aware of the accident

Ricord relates that the celebrated actress, Madelene Brohan, suffered from a tumour of the mamma which baffled her medical attendants. The diagnosis wavered between a tumour of an adenoid nature and scirrhus. Ricord examined the case and distinctly felt a needle prick his finger. It was easily forced outwards and extracted, greatly to the surprise of the patient, who could give no clue to its introduction. Ricord advised the lady to use another pincushion for the future! The indurated swelling rapidly disappeared. Velpeau had actually proposed to remove the tumour in this case.

M. Dolbeau once cut down upon a hard, painful tumour of the breast, believing he had to do with a painful fibroma. He found a small needle embedded in a quantity of plastic material. The tumour exhibited the curious symptom of crepitation on manipulation, due to the friction of the needle against the rib-cartilages, and this may have raised a suspicion of its true nature.[1]

M. Despuis also encountered a case where a deeply-seated induration in the breast of a young woman gave rise to peculiar symptoms. It was opened, but apparently a sinus persisted. On further examination, a fragment of clothing was withdrawn, and two small fragments of matches. The patient now remembered having been struck upon the breast in falling to the ground, and that at the time she was carrying matches in her hand.

A surgeon near Inveraray in Scotland published the following interesting case as long ago as 1785.

A young woman, aged twenty, came with a tumour to the inner side of the left breast, which felt to the touch like a thick goose-quill suspended in a perpendicular direction about two inches from the nipple. A slight pricking pain was present on pressure. The swelling was cut down upon, and a common sewing-needle extracted. The patient had no knowledge as to how the foreign body had been introduced.[2]

No remarks need be made upon these exceptional cases, which tell their own tale, and carry their own instruction.

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[1] *Bulletin de la Soc. Anat.* vol. v. p. 349.

[2] *Edin. Med. Commentaries*, vol. ix. p. 275.

CHAPTER IV

AFFECTIONS OF THE NIPPLE AND INTEGUMENT OF THE MAMMA

Defects in conformation — Kehrer's operation — Eczema and fissures — Abscess — Syphilis of nipple and areola — Morbid discharges from nipple — Pendulous tumour — Epithelioma — Sebaceous cyst — Lupus — Molluscum — Neuroma — Erythema gangrenosum — Spontaneous ecchymosis — Keloid — Scleroderma — Sarcoma of skin of mamma — Melanosis — Paget's disease — Dermatitis maligna — Lenticular carcinoma and "cancer en cuirasse."

Defects in Conformation.—The interesting points connected with absence or multiplicity of nipples have already been touched upon in Chapter I. It has been pointed out that the greatest difference exists between the development of the nipple in different individuals, and while one young woman may have a prominent well-developed nipple, another may have these organs sunken in a deep recess from whence it is difficult for the child by suction to withdraw them. Some nipples are impaired, or absent altogether, especially in accessory mammæ. Others are bilobed, or the foliaceous arrangement of the papillæ exaggerated, so that the nipple is very deeply cleft and divided.

Depression of the Nipples.—Too much stress cannot be laid upon the importance of this subject, which is a fertile source of much misery in suckling, and a probable originator of many mammary affections. In the slighter cases, abolishing the pressure of corsets, and methodical drawing out of the nipple by an exhausting pump, is usually all that is required. The method of surrounding the depressed nipple with a circular piece of thick plaister was first brought into practice by Dr. Henry Davies.[1] The steady pressure of the plaister, aided by a bandage, allows the nipple to become more and more prominent. Herman[1] writes with approval of the operation of Kehrer of Heidelberg, which essentially consists of excising a crescentic portion of skin on either side of the depressed nipple. The edges of the incisions having united, the nipple becomes more prominent. Herman speaks of having twice performed this operation with advantageous results, but the operation seems not often to be practised in this country, and personally I have never had recourse to it.

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[1] *Med. Times and Gazette*, 1852, p. 350.

Eczema.—Since the writings of Paget in 1874 this affection has obtained peculiar significance, for he established the fact that certain cases of inveterate inflammatory conditions of the areola and nipple are followed by the development of cancer. This subject is of great importance, and we prefer first to treat of ordinary eczema with which malignant dermatitis must not be confounded, which is amenable to treatment, and which is common about the nipples of blonde women with delicate skins.

Causation. — Many local conditions continue to make eczema about the nipple common. The moist and sodden condition of the integuments from the mouth of the child, combined with the friction of the corset, and especially the entrance of micro-organisms into minute fissures and "chaps," are obvious and sufficient reasons for the occurrence of eczema in this locality.

Some of the worst cases of eczema of the nipple and areola I have seen, have been associated with local skin infection by the pus issuing from a mammary sinus in neglected instances of abscess among the poor. The poulticing of a mammary sinus keeping the skin sodden with fluids and pus is also responsible for the onset of this disease. Many cases of eczema of the nipple will be found in unmarried women, and the process then commences as a seborrhœa, organisms invading the areas of skin covered by the discharge. General erysipelas may readily take its origin in a "cracked" or eczematous nipple.

Hutchinson relates a good example of this in the *Clinical Journal* for

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[1] *Lancet*, 6th July 1889.

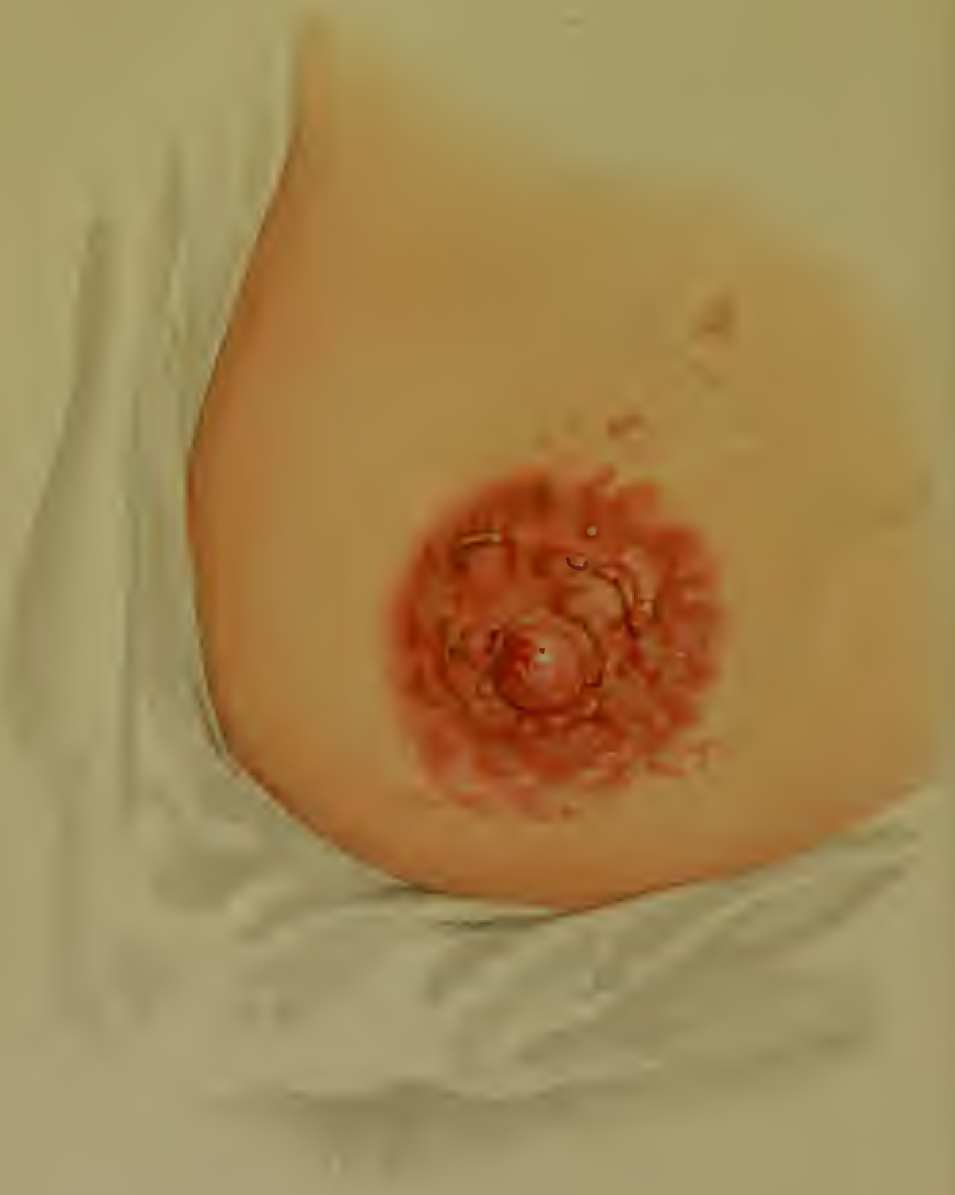

PLATE III.

Lactation eczema, to show the fissures and cracks, with adherent yellowish crusts.

To face pag

27th June 1894. A married woman, aged twenty-nine, was passing through a most acute attack of eczema, attended with œdema and vesications. Her whole face was swollen, red and weeping, and the eyelids almost closed; her hands and forearms were in a similar condition, and so also was the left side of her chest. The affection was reputed to have spread from a cracked nipple, and she had never suffered from eczema before. The hands looked much as if they had been irritated by some washing-powder, or had been put into too hot water. Everywhere the condition was attended with the most vivid erythema and the rapid production of vesications. The whole attack was only of about a week's duration. Although the temperature had somewhat increased, and the patient had been chilly, there was no distinct rigor, nor did the febrile disturbance prevent her from going out. The case was a typical example of eczema-erysipelas. Those who refuse to recognise hybrid maladies would probably be equally divided as to whether to call it eczema or erysipelas. His belief was that there were not infrequently inflammations that partook of the nature of both. In these the disease ran a far more rapid course than in eczema, was attended by more febrile disturbance, by vesications, and œdema. At the same time, the fever was never so high as in erysipelas, and the tendency to vesication and the formation of crusts was much greater. Very often, as in this instance, there was a history of the disease having commenced from some slight traumatic lesion.

Symptoms.—Much itching and burning is experienced, with moist discharge which stiffens linen and rapidly forms yellowish crusts; these being detached leave a superficial rawness associated with fissures and cracks. The process spreads over the areola and adjacent skin. There is an absence of thickening and infiltration of the integument or parts beneath, and the margins of the patch are not rigidly defined. When the eczema becomes chronic, considerable thickening and infiltration may occur as in other parts.

Treatment.—It is especially important that eczema of the nipple be early and carefully treated. Every effort should be made to prevent the affection becoming chronic. The part should be carefully dried and at once freed from all moisture and discharge. Powdering with the "pulvis zinc oleati" is very efficacious, especially if there be hyperidrosis of the infra-mammary furrow. Suckling should be interdicted, and if it be absolutely needful to put the child to the breast for the relief of engorgement, the nipple and adjacent parts should be protected with a gutta-percha shield. The crusts and scabs should be removed by bathing them with a weak and warm alkaline lotion to which finely powdered oatmeal has been liberally added. A most useful local application also is warm rice water. If the part be previously covered for a night by a piece of fine gutta-percha sheeting, the crusts may be readily detached, all scabs and dried products of exudation being removed. Some of the familiar applications for eczema are then carefully applied.

Among mercurials may especially be mentioned the white precipitate ointment, or ointments of the yellow oxide of mercury or diluted ung. acid nitratis, which formed the most important ingredient of "Velpeau's ointment." Among the empyreumatic preparations, icthyol ointment usually dilute, and dilute solutions of carbolic acid, or liquor carbonis detergens. When the acuter symptoms have subsided, an ointment of nitrate of lead, gr. x. or gr. xv. to the ounce, is very useful (Fordyce Barker). The same difficulty is often experienced in selecting local remedies for eczema of the nipple, as is experienced in other parts. Dilute sulphur ointment has given good results in my hands. The great principle in the treatment of eczema of the nipple, is to use mild and soothing remedies so long as there is much hyperæmia, and to postpone stimulating treatment until this is subdued.

We will not pause here to consider whether eczema is purely a local disease or not. Clinically it is tolerably certain that eczema is improved by all conditions of dietary and medicinal treatment, calculated to improve any obvious constitutional defect that may be present. Thus in a stout and plethoric woman, where the eczematous condition is associated with much hyperæmia and inflammation, purgation, antimonials, with limited diet and the interdicting of alcohol, will generally be beneficial. In the opposite condition, when the woman is pale and anæmic, and especially in the eczema which accompanies suppuration, the iron and arsenic salts are singularly beneficial, and carbonate of iron in large doses is a favourite remedy of my own.

Cracks—Fissures—Excoriations.—These troublesome and painful affections are often associated with eczema, and are almost invariably caused by injuries received during lactation. They are fertile causes of irritation and inability to suckle, and of consequent mammary engorgements and abscess. The efforts of the child to seize a badly developed nipple are often productive of these affections, and emphasises the importance on the part of the practitioner of attending to the condition of the nipples during pregnancy, of having them drawn out by a pump if retracted, and daily washed with a spirit and lead lotion, or some other dilute astringent calculated to harden the integument.

When the fissures have formed, the pain caused by suckling may be very great, and it is usually better to draw off some of the milk daily with the ordinary breast-pump, or to adopt some kind of artificial nipple, lest general engorgement should occur.

The local treatment of "fissures" is of great importance, and they are often troublesome to heal. Should the pain, itching, and smarting be very intolerable, a 5 per cent solution of cocaine may be occasionally painted on. Lotions of borate of soda in rose-water commonly give great relief. Should the cracks and fissures be very deep, the occasional application of a fine-pointed stick of nitrate of silver, preceded by cocaine, gives better results than anything I am acquainted with.

As in eczema, a modern and very convenient form of applying remedies to fissures of the nipple and areola, is by means of films of the glycerine jelly of Unna. To this may be added such agents as icthyol, resorcin, carbolic acid, boric acid, or astringents as lead, zinc, tannin. Again, mercurial, antiseptic, or astringent remedies may be applied by means of pencils made of gelatine or with a basis of cacao butter. Care and cleanliness, with applications of this nature, seldom fail to effect a cure. The troublesome and unsatisfactory nature of these cases among hospital out-patients, must on no account be taken as a criterion of the progress and treatment amongst those who are able to afford care and attention. In exceptional and neglected cases, the ulcerations about the base of a nipple may extend so deeply as to entirely destroy it, or by cicatrisation to seriously deform and alter its shape.

Abscess of the Nipple and Areola.—In association with cracks and fissures, suppuration of the nipple and under the skin of the areola may occasionally arise. The pus either collects in one of the main ducts, or in a suppurating sebaceous follicle. The treatment presents nothing peculiar. An opening with a fine instrument, as a cataract knife, should be early made in a direction radiating from the base of the nipple. The greatest care should be taken not to divide the galactophorous ducts. In my experience this affection is more rare than abscess within the breast itself. Velpeau well points out that a large number of cases of inflammation of the nipple and areola will terminate in resolution, if the exciting cause, the irritation of suckling, be removed.

In the chapter on mammary abscess, it has been mentioned that a certain number of cases present the phenomena of suppuration of the lacteal ducts. In such cases drops of pus exude from the nipple, especially on making pressure towards its base. Weaning of the child should be at once instituted, the nipple well bathed with a lotion of perchloride of mercury (1 in 1000), and a compress of boric or salicylic wool applied. Unless a distinctly pointing swelling, the size of a pea or hazel-nut, in the areola or base of the nipple, should definitely mark the position or extent of the abscess, the knife had better not be employed, and the greatest caution should be exercised not to divide a milk-duct transversely. The sebaceous follicles on the areola may suppurate as small boils or pustules. Their treatment presents nothing peculiar.

Syphilis.—Syphilis of the nipple and areola is rare in the female, and very exceptional in the male breast. The primary chancre, secondary manifestations, or some of the late cutaneous symptoms of the affection, as rupial scabs, serpiginous ulcers, or copper-coloured tubercles, may all be exemplified. In a total of 9050 extra-genital chancres, 1148 occurred on the breast and nipple.[1] Out of 642 cases of extra-genital chancres, there were 19 of the breast.[2]

Primary syphilis of the areola or nipple is a matter of considerable importance in practice, and is more often seen among the poor of large cities than among the "well-to-do" classes, yet it may be met with in the most unexpected quarters, and is then only too likely to be misunderstood.

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[1] Bulkley, *Syphilology*. Edited by Morrow, vol. ii. part i. p. 69.

[2] Fournier, *Les Chancres Extra-Génitaux*, p. 9.

It is especially important to remark that in a proportion of these cases, certainly in several I have seen, the lesion near the nipple does not in the least conform to the ordinary description or appearance of an infecting sore. Syphilitic cracks or fissures upon the nipple are far less painful than is

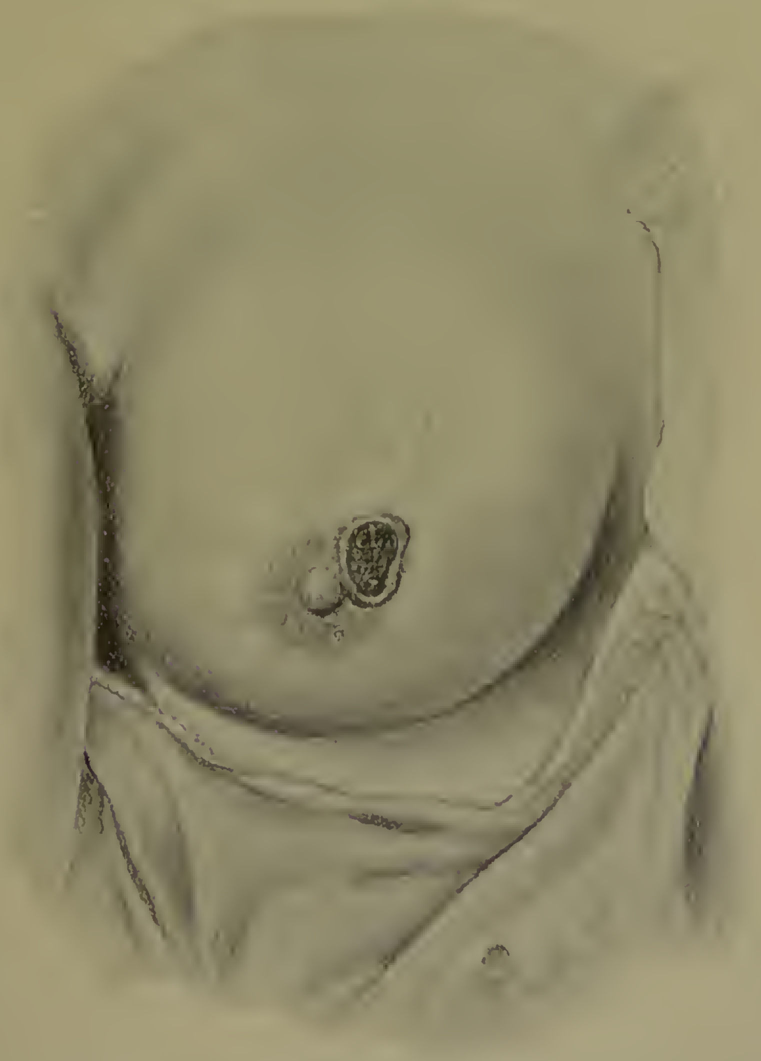

FIG. 17.—Primary chancre of the areola drawn from a single woman aged twenty-two. There was a large axillary buboe and severe sore throat.

the case with the ordinary cracks and excoriations of lactation, and the absence of tenderness should arouse suspicion in such cases (Bumstead). Perhaps the more common type, is that of a shallow circular painful ulcer near the base of the nipple, and extending a little way upon it. The surface of the ulcer is glazed and smooth, and slight parchment-like induration may be perceived on taking it between the finger and thumb. In other cases the whole nipple may be hard and infiltrated (chancrous infiltration). The presence or absence of suppuration is of small moment in these cases, from the friction of the clothes and other causes of irritation. The axillary glands are enlarged, hard, and bullet-like, and a syphilide early appears on the skin. In some cases, when the lesion is towards the skin side of the areola, the typical chancre is present, with induration or mushroom-like fungation. Multiple chancres are not unknown. I have seen one instance of this kind, where quite typical and unmistakable chancres occurred in the integument of each breast, and upon one areola. Fournier relates a case of twenty-three chancres, seven upon one breast, sixteen on the other.[1]

Any surgeon who has seen much of primary syphilis upon the penis knows that the local primary manifestation is frequently atypical, consisting indeed in a tiny crack, insignificant ulcer, or dusky itching pimple too often ignored by the patient. Whether it be change in the type of the disease or not I do not know, but speaking with the authority of many years' out-patient practice in London, I am sure that the typical "Hunterian sore" of the text-books is now comparatively seldom seen, and faulty diagnoses are in consequence only too common. So with the nipple. Any unusual lesion should ever suggest the possibility of syphilitic infection, and a watch should be kept on the axillary glands, and for a "rash" on the skin. Again, the primary sore may be deeply excavated, and covered with a black or brown scab (ecthymatous chancre of Bumstead), and Fournier describes quite a variety of these sores in his excellent work on extra-genital chancres.

In the vast majority of cases, syphilis is inoculated upon the nipple of a non-syphilitic mother through the mouth of a

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[1] *Les Chancres Extra-Génitaux*, p. 360.

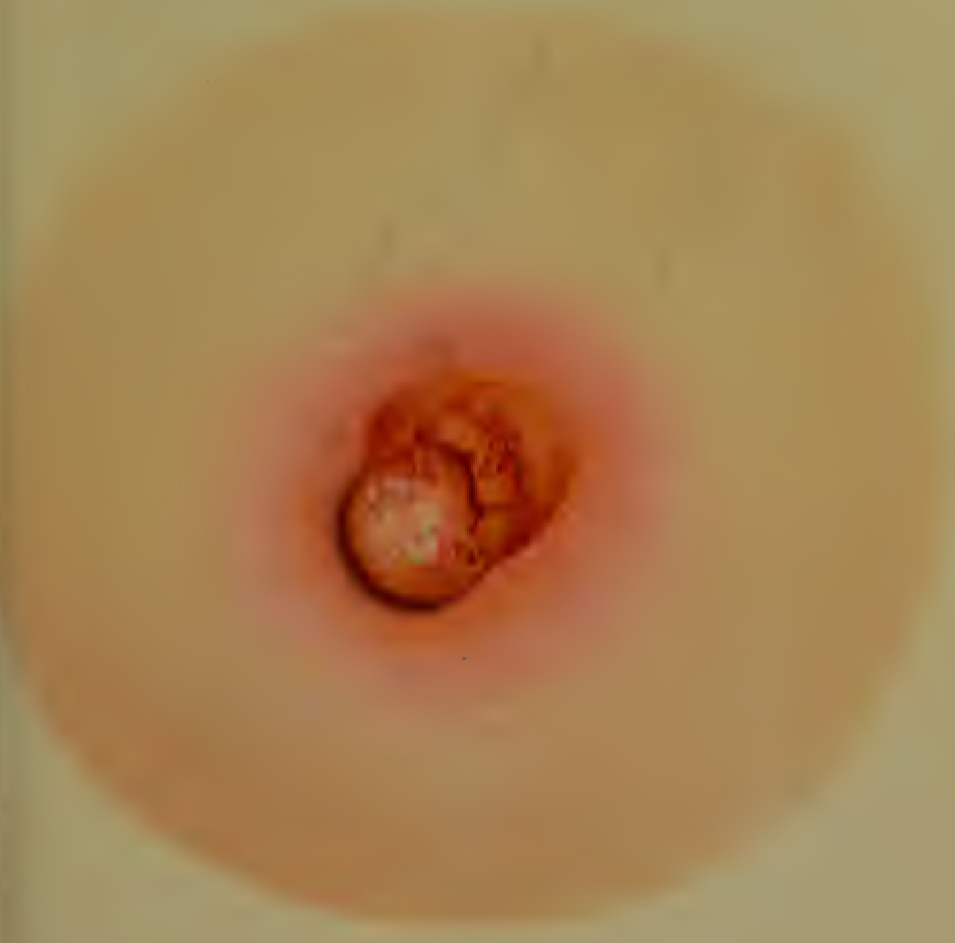

PLATE IV

Primary chancre of the nipple. The parts are greatly infiltrated and thickened.

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syphilitic nursling. In the case of unmarried women, history is rarely obtainable, since the source of infection is probably from the lips of a member of the other sex. Conversely, in selecting a wet nurse a judicious practitioner will reject all such as have cracked or sore nipples. In the nursing of a syphilitic infant, a wet nurse must, of course, never be employed. If such a woman became infected legal consequences may readily arise. Young practitioners may easily fall into this serious error, and I here take the opportunity of prominently drawing attention to it.

In an excellent article on this subject by M. Jules Dimey, chancre of the mamma is found to be far more frequent in women than in men. The lesion is frequently multiple, even in the case of both breasts. The chancre may be a deep erosion and covered with an ecthymatous scab.

Fournier in his unrivalled experience of these conditions, tells us that chancres of the nipple occur nineteen times out of twenty from suction by a syphilitic child. Other causes are suction from the mouths of men, or from infected "breast-pumps." This author found thirty cases of single chancre to twenty-six multiple. The lesion he has noted but rarely on the skin of the breast proper. He refers to infection through a crack or erosion, and also to a deeply excavated ulcer. After a "chancre" of the nipple has disappeared, a permanent brown macula usually marks its site.

In a recent clinical lecture Professor Fournier says the first indication of the ulcer is a slight round elevation like a small bean ; next the area becomes dark red with a hard border. Finally the centre desquamates, and an ulcer appears. He illustrates multiple herpetiform chancres of the mamma described by an author, who had seen twenty-five such lesions on the breast. Fournier himself had counted twelve. The incubation period, varieties, and sequelæ are much the same as elsewhere. He mentions the difficulty of deciding whether fissures are syphilitic or not, and advises in cases of doubt to wean the child and see if the lesions yield to local treatment. He concludes by pointing out the disastrous consequences that arise from overlooking breast chancres. In a small locality in Italy, three hundred cases of syphilis were caused by a single breast chancre. A wet nurse infected an infant. It brought syphilis to the lips of its mother, its grandmother, and two virgin sisters. The wife infected her husband. In a small town in France fourteen persons were infected from one breast chancre, and four of these died. Such dreadful calamities are exceedingly rare, but they illustrate the extreme caution that must be exercised in these cases.—*Illustrated Clinics*, vol. iii. p. 261.

Colles' law, that a healthy mother cannot be infected through her syphilitic nursling, holds good. But cases are sometimes quoted, which if they are correctly reported shake our faith strongly in this dogma. The probable explanation lies in the fact, that very young children occasionally get accidentally inoculated with primary syphilis, and afterwards contaminate their healthy mother. A most important and interesting case of multiple primary chancres of the nipple is related in the *Lancet* for 9th June 1894 by my friend Dr. J. A. Coutts. Here a mother became infected from the sore mouth of her own syphilitic child, and the case forms an apparent exception to Colles' law, Dr. Coutts having carefully negatived the possibility of primary inoculation of the infant. A similar and striking case is as follows:—[1]

"A woman came to my out-patient room last August with three ulcers on her breast. Each of the ulcers presented the characteristic signs of hard sores. The sores were situated about an inch from the nipple, and extended nearly two-thirds round the breast. On examining the baby which she was nursing, I found that it had ulcers on the mouth, snuffles, and condylomata on the anus, with the well-marked *café au lait* complexion. The baby was eight months old; the mouth had been sore for two months. The ulcers on the mother's breast had appeared one month later. She was thirty-one years of age, had been married thirteen years, and had eight children, of which three had died at the ages of four and a half years, one year, and nine months. The five living were quite healthy, and she had had no miscarriages. She had always had good health herself. Her husband (a labourer) she stated, had nothing the matter with him. She was treated with lotio nigra and hydrarg. c. creta gr. ij three times a day.

On examination the next week I found the chancres cleaner and more typical. On the arms and chest a secondary rash was appearing, and she had some pharyngitis. Unfortunately she did not attend again."

This case, I think, deserves publication as an exception to the recognised law of Colles, that a mother cannot be infected by her own syphilitic child.

Chancroids are, I believe, very rare on the breast. I am quite unacquainted with them, but Bryant states that he has seen several examples of both infecting and non-infecting sores. So far as I have been able to ascertain, chancre of the nipple is by no means common in this country. Having for twelve years watched for these cases in London hospital practice, I have seen but four. As an example of how slight may be the local manifestations of true syphilitic infection by the nipple, the following history will show.

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[1] Albert Lucas, F.R.C.S., *Brit. Med. Journ.* 1st December 1894.

In October 1894 I saw a case of syphilis of the nipple, by the kindness of my colleague Dr. Gow, at the Waterloo Bridge Hospital. A florid, well-developed servant, unmarried, presented on the left nipple near the base a small superficial ulcer. This presented nothing characteristic, and its true nature was only manifested by a "coppery" rash on the skin and enlarged axillary glands. When I saw the case, this little ulcer had soundly healed under a simple ointment, and there was no induration or anything that might lead one to believe, that so serious a matter as syphilitic infection had taken place. There was, however, a gland the size of a large bullet to be felt in the axilla. A rash was fading on the skin, and a "secondary" ulcer was plainly to be seen on the right tonsil. As usual, no history was obtainable in this case.

On the contrary, extensive infiltration and thickening may occur, leading to a great enlargement and hardening of the nipple, as in the following remarkable case.

A respectable married woman, aged thirty, came under my notice at St. George's Hospital in August 1896. She had been married for six years and had one healthy child. Three weeks before I saw her, the left nipple became slightly sore on one side. On examination there was a shallow excavated ulcer at the base of the left nipple. It was indolent, not suppurating, with a glazed surface of gelatinous aspect. The edges were not hard. In the axilla were two enlarged glands. There was no history of having suckled a strange child, and indeed the woman could assign no cause for the malady. The case was watched. In about a week after I first saw the case, the symptoms were more evident. The swelling and induration were more marked, and the nipple became very painful. The glandular affection in the axilla was more evident. I requested that I might examine the husband, and this was done on 26th August. He had contracted syphilis four years before, and though he had regular intercourse, he never infected his wife in the ordinary way. No children had been born. On the left side of the tongue was a mucous plaque, and a similar condition existed at the angle of the mouth. The case is a most interesting one, as showing the mode of syphilitic contagion from a local manifestation. The further progress of this case was typical of severe syphilis. The history of late infection by the husband is very unusual, but I ascertained the facts with care.

A summary of the principal clinical characters of primary syphilis affecting the breast may thus be presented.

Chancre may be found upon the areola, nipple, or skin of the breast in both sexes at any age. It is very rare in the male, and far the more common in the case of lactating women, who have suckled a strange syphilitic infant. It is more generally single than multiple, and either breast or both may be attacked. The base of the nipple, the areola, is the favourite site, more rarely the integument of the breast. The characters of the lesion, as is the case on the penis, differ very widely. Thus there may be a mere shallow erosion, a fissure or crack, or a large excavated angry-looking ulcer covered with a scab (ecthymatous form), or an ulcer with offensive discharge and coloured slough (phagedænic variety). In cases of suspicion the enlargement of the axillary glands, sore throat, and the appearance of a faint roseola upon the skin, should be carefully looked for, and cases will occur, where time alone will clear up a dubious diagnosis.

The eruptions of secondary syphilis may be found on the breast, and these present nothing peculiar. I have once, and only once, seen condylomata upon the areola in a young woman who had a profuse "secondary" roseola, with condylomata in the axillæ and between the toes. I have several times seen condylomata on the moist skin between a pendulous breast and the thorax.

Velpeau speaks of the modification of eczema of the nipple by the syphilitic virus, and notes a case in a young prostitute of twenty. "The nipple and areola presented a well-marked copper tint. The surface was damp, and there constantly oozed from it a reddish humour, which was presently succeeded by scales of a dirty, grayish, copper colour. The disease was of six or eight months' duration." The affection cleared up under anti-syphilitic treatment. The girl had five months before been under treatment for syphilis at the hospital "Du Midi."

Tertiary syphilitic eruptions may be found upon the skin of the mamma, and I have several times seen circular or irregular ulcers near the nipple. They show a tendency to heal, leaving serpiginous, white cicatrices, and are covered when healing with brown or black scabs.

Morbid Discharges from the Nipple.—In the chapter on Abscess of the Mamma reference is made to the possibility of pus being discharged with the milk. Discharges of blood

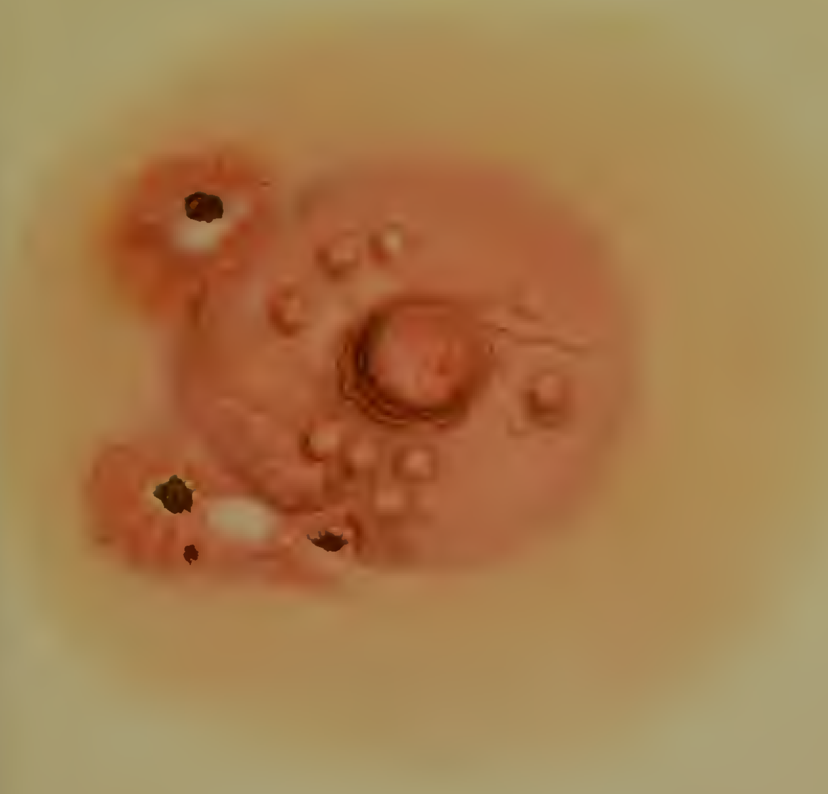

PLATE V.

Syphilis of areola and nipple in the late or tertiary stage

e page 138.

and serum, are associated with the presence of cysts and morbid growths, of which a coloured discharge from the nipple ducts is often the first important sign. Many authorities dispute the existence of "vicarious menstruation" from the nipple, and personally, I have never seen a case, but instances are related which seem indisputable.

Dr. Robert Barnes states that he saw a girl at St. George's Hospital in 1876 who had vicarious menstruation by vomiting and also oozing of blood from the nipples.[1] Hoshkevitch of Kherson [2] tells of a woman, aged forty-two, who suffered from metrorrhagia caused by a uterine polypus from twenty-nine to thirty-six, and in whom the catamenia ceased on extraction of the polypus. After the cessation of the menses there began to occur slight periodical hæmorrhage from the right nipple. Five to twenty drops issued daily lasting several days and recurring every month.

Mr. Stear of Saffron Walden reported a case at a meeting of the Cambridge Medical Society on 14th April 1882. A woman, aged fifty, had menstruated regularly until about two years ago, when the discharge ceased. For twelve months past she had suffered from a discharge of blood from the nipples, which recurred every month and lasted from three to four days, so that she was obliged to wear a napkin. The breasts at this time were painful as was usual at the menstrual periods. Mr. Stear spoke clearly as to the genuineness of the discharge, which he had seen himself. A very similar case is related by Tueffard [3] where a lady, aged fifty-six, had regular monthly bleedings from the nipples, the discharge lasting eight days, and the breasts becoming large and painful, to be again flaccid in the intervals.

Doubtless other instances of this curious freak of nature are known, but the above cases seem sufficient to prove what many have doubted. In all the cases no harm seemed to come of the monthly discharge. The axiom that most cases of discharge of abnormal fluids from the nipple, are due to dilated ducts or cysts which evacuate by this route, is well exemplified by the following cases:—

A lady, aged thirty-eight, childless, but of large mammary development, noticed a dark discharge from the left nipple which continually stained her clothing. Her medical attendant upon examination found to the inner side of the nipple and deep in the breast an oval tumour the size of a filbert. On pressure the dark fluid before named oozed from the nipple. The patient had no idea until then that she bore a tumour within the breast, and she was much agitated and alarmed. Acting on the advice of Sir James Paget, who strongly urged the innocent nature of the affection, I made an exploratory incision on 18th June 1896, and a small cyst full of blood-stained fluid was dissected out. The mammary tissue in the immediate neighbourhood was much indurated, and was freely removed, the outlines of the cyst being very indistinct. Under the microscope the thickened tissue around the cyst showed very marked epithelial proliferation, and at one spot carcinoma appeared to be established. As the parts had been freely removed, it seemed justifiable to watch the case for further developments.

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[1] *Medical Press and Circular*, 12th May 1886.

[2] *London Medical Record*, 15th July 1884.

[3] *Medical Times and Gazette*, 14th December 1872 (*Union Médicale*, 30th Nov.).

A lady between forty and fifty years of age consulted me, by the advice of Dr. Mackay of Devizes, in April 1897. For upwards of six years she had a brownish discharge from the nipple. This was occasionally very free, so as to soak her clothing. The breast had lately become painful, and the periods of pain and discharge alternated. On examination the mammæ were very voluminous, and below the left nipple an ill-defined swelling the size of a large bean could be, with some difficulty, made out. Before the patient was anæsthetised the position of this swelling was marked in indelible pencil. An incision was made, and carried slowly through much fat, the edges of the wound being well retracted. The finger reached the indurated patch, which was situated at a great depth, and was freely excised. The mammary tissue removed was a little condensed. In the centre lay a cyst as large as a grape, with a small intra-cystic papillary growth. The wound healed soundly in six days, and the discharge from the nipple ceased permanently.

These cases teach us the important lesson, that in all cases of morbid discharges from the nipple, the medical attendant should make a most careful examination of the whole of the breast on several occasions. For some cysts may so freely discharge that they temporarily disappear, to be again evident and painful when they refill. Hence mistakes in diagnosis may readily arise, unless great care be taken to examine the case on several occasions. As a rule, when the breast is painful the cyst is tense, and relief is experienced when discharge occurs. Examination during the "painful period" will often detect an ill-defined swelling, which is really a tense and deeply-seated cyst, surrounded by condensed tissue.

MORBID GROWTHS OF THE NIPPLE, SKIN, AND AREOLA

Pendulous Tumours.—Small pendulous tumours of soft connective tissue and fat are found upon the skin of the breasts, and present nothing peculiar. In some cases of carcinoma in elderly women, these little, brown, wrinkled growths are numerous, and scattered freely over the integument of the face, chest, and neck. I doubt that they are more than merely coincident with the cancerous affection.

Pendulous tumours of the nipple demand a more extended notice. They are lobulated and foliaceous, and attached to the nipple or its base by a stalk, which becomes lengthened and attenuated, but which usually contains a pulsating artery. In addition to cutaneous elements and fibrous tissue, these tumours contain the tissues of the nipple, should that be involved, and especially the sebaceous and odoriferous glandular structures found about the areola. A fine specimen, very lobulated, is in the Museum of St. Bartholomew's

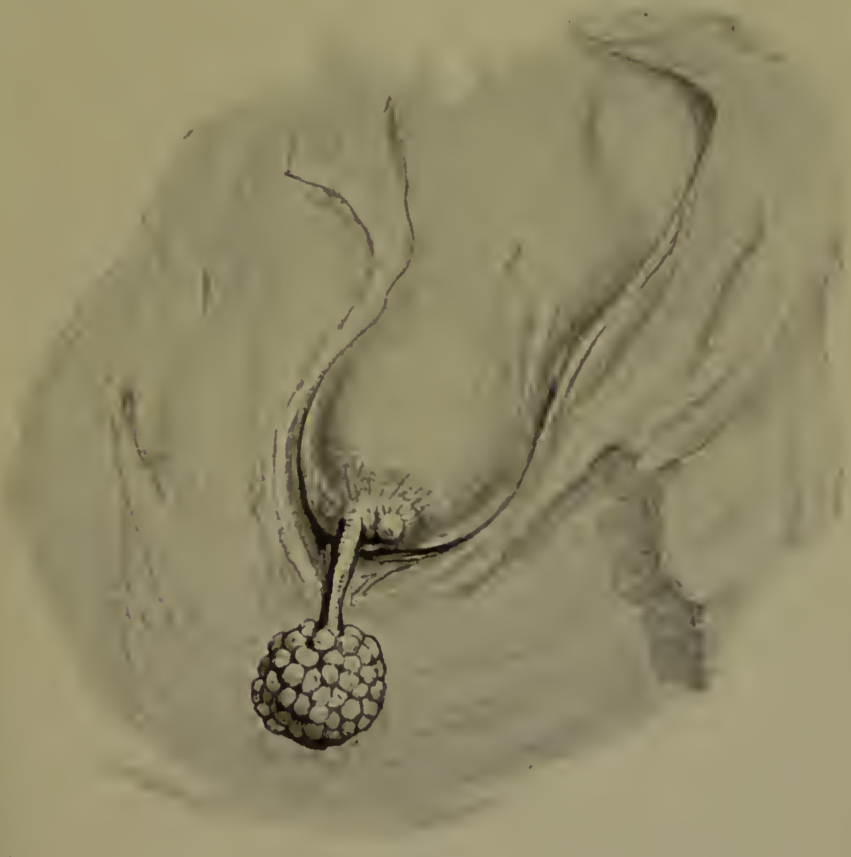

FIG. 18.—Pendulous fibro-cellular tumour of the areola, which had existed for over twenty years.

Hospital; it had been growing for nine years, and it is described in the catalogue as "fibroma" (3187). An elaborate article on this affection was written by O'Ferrall in the Dublin *Journal of Medical Science.* He refers especially to the implication of glandular structures in these tumours.

An excellent example of this disease is also related by M'Swinney in the reports of the Dublin Pathological Society for 1875. The patient was an unmarried woman of fifty years of age, and the tumour had slowly grown since the advent of menstruation. It was ulcerated upon the surface, and exuded an offensive muddy liquid. The tumour was six or seven inches in length, and the bulbous extremity was five or six inches in circumference. Taking the pedicle between the finger and thumb, a considerable artery could be felt pulsating in it.

I have seen a similar case in a spinster of advanced age, who had borne the tumour the greater part of her life. The secretion from the surface was abundant, sticky, and very offensive, soaking through the linen. The patient would never allow the growth to be removed, as she had been assured it was cancerous and would return.

The surface of these growths is sometimes quite verrucose. A specimen of this appearance is preserved in the Museum of the Royal College of Surgeons (4819 A). One of the best specimens in London will be found in the Museum of St. Mary's Hospital (1456). It is stalked and very foliaceous. There is also a specimen in the Middlesex Hospital of a fibro-cellular structure, stated to be congenital in origin. It became turgid at the menstrual periods (2091).

The largest pedunculated tumour of the areola I have read of, is reported by Shaw in vol. iii. of the *Pathological Society's Transactions.* It was removed from a woman aged forty-four, had lasted for ten years, and commenced like a small wart near the nipple. The pedicle was as thick as the finger, and contained two pulsating arteries. The tumour was lobulated, the size and shape of the mammary gland; it weighed five ounces. An excellent illustration of pedunculated tumours is also given by Bryant from a specimen in the Guy's Hospital Museum.[1]

There can be no doubt, in some of these cases, that the character of papilloma are predominant. According to Jamain and Terrier, a pedunculated tumour of the nipple has been reported, which on section, after removal, proved to be a cavernous angioma.[1] Sufficient of these curious cases have been referred to, to illustrate their principal clinical features.

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[1] *Diseases of the Breast,* p. 333.

The treatment of such tumours is simple and obvious. Where the pedicles are greatly attenuated, an elastic ligature is a convenient method of treatment. Should the pedicle be short and bulky, the growth may be excised by an elliptical incision; one or more vessels will require ligature, and the parts should be elaborately purified before cutting, as the skin will be sodden and foul with the exudations from the growth, and swarming with micro-organisms. The tumours will never return.

Angioma.—Cutaneous nævi of the breast and nipple are met with, and in their treatment two points have to be considered—the avoidance of excessive scarring and of methods that may lead to deformity. Electrolysis is, usually, a good mode of treatment, or excision should the site of growth permit of it. In cases of more extensive nævoid formations, where the mammary tissue as well as the skin is involved in a sponge-like venous tissue, great precautions should be observed in treatment, for such growths bleed persistently and furiously. The only case of this rare disease I am acquainted with, nearly ended fatally from bleeding resulting from an exploratory incision. Bryant, in his work on Surgery, alludes to a case of a nævus involving the whole of the breast. Jamain and Terrier allude to this condition merely to mention its rarity, and refer to cases mentioned by Virchow and Langenbeck. The subject will be again alluded to under the heading "Angiomata" of the breast proper.

In December 1896 a healthy woman, forty-two years of age, came to the Waterloo Bridge Hospital, having upon the sternal aspect of the left mamma a small reddish tumour the size of a nut. It was obviously cutaneous, and had been growing for two years. It was excised by Mr. Key, the house surgeon. I examined this little growth with my colleague, Dr. Rolleston. It was a cavernous angioma. In some places it appeared like a sarcoma, and we were inclined to regard it as an example of angio-sarcoma of the skin of the breast.

Epithelioma and Rodent Ulcer.—True epithelioma of the nipple is a rare condition, but sometimes occurs in elderly persons of both sexes. The induration and hardness is excessive, and an ulcer, with a foul discharge full of debris and hard, warty edges, form, as elsewhere, the characteristics of the disease.

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[1] *Manuel de Pathologie et de Clinique Chirurgicales*, tome iv. p. 711.

Mandrey operated upon a woman of sixty-one years, who presented a tumour of the nipple the size of a pea, which, on microscopical examination, proved to be an epithelial carcinoma. He extirpated the entire mammary gland and cleared out the axilla. The patient recovered without complication. Mandrey regards the orifices of the galactophorous ducts as the primary seat of the disease. Examination of German literature revealed but very few cases, while foreign literature yielded a number of cases under the term "Paget's disease," that were partly epithelial carcinomata.[1]

According to Jamain and Terrier, epithelioma has originated in the "eczema intertrigo," which forms so common a cause of irritation in the lower mammary furrow of obese women. They also refer to a case originating in a scar. I prefer to consider true epithelioma of the nipple as distinct from "dermatitis maligna," with which, however, many authors class it. Some of the cases of mammary cancer, when the nipple is destroyed by ulceration, are probably instances commencing in the ducts; in fact, they are duct cancers, spreading downwards into the mamma.

This is well shown by a specimen (13 A, series xv.) in St. George's Hospital. It was labelled "epithelioma of nipple," and was removed by Sir Prescott Hewett from a lady, aged forty, in 1872. Rolleston kindly re-examined this specimen for me in 1897, and found it to be a columnar-celled carcinoma originating in the walls of the larger ducts, spreading down them, and in the deeper parts the transition to spheroidal carcinoma could be plainly seen. No cell nests were visible. The specimen was really therefore a duct carcinoma. There are three specimens labelled as epithelioma of the nipple in the Museum of the Royal College of Surgeons. One of these is very remarkable (4820 A). It was presented by Dr. Collins, and the story states that it had originated in the nipple of a woman, aged fifty-eight, the mother of a large family. The specimen shows a huge lobulated mushroom-like tumour, which overhangs the surrounding skin, and the growth can plainly be seen spreading downwards into the mammary substance. Histologically the growth is said to be a squamous-celled carcinoma with "cell nests." This specimen affords an undoubted example of an exceptional malady (Fig. 19).

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[1] *Beiträge zur klinischen Chirurgie*, Bd. x.; and *Annals of Surgery*, vol. xvii.

I have never seen an instance of true rodent ulcer on the female breast, though there is no reason why it should not occur. A case has been described on the nipple of the male by H. B. Robinson, and the specimen is in the Museum of St. Thomas's Hospital. On looking at this preparation, there seems to me to be an undue amount of solid growth at the base for true rodent ulcer.

Sebaceous Cysts.—Small sebaceous cysts near the nipple are not unknown. They may originate in the glands of Montgomery; I have never seen them larger than a pea, and their treatment is conducted on general principles. As a rarity, sebaceous cysts near the nipple may attain to a considerable size. Such a case is related by Birkett in the Guy's Hospital Reports for 1859. The tumour had been growing for ten years near the right nipple. It is described as being 6 inches in diameter, and was supposed to be cancerous and therefore freely removed. After removal the tumour was found to really be a thick-walled cyst, containing three to four ounces of serum tinged with blood. The fluid was full of cholesterine, and Mr. Birkett expresses no doubt in his paper that the cyst had originated in a sebaceous gland.

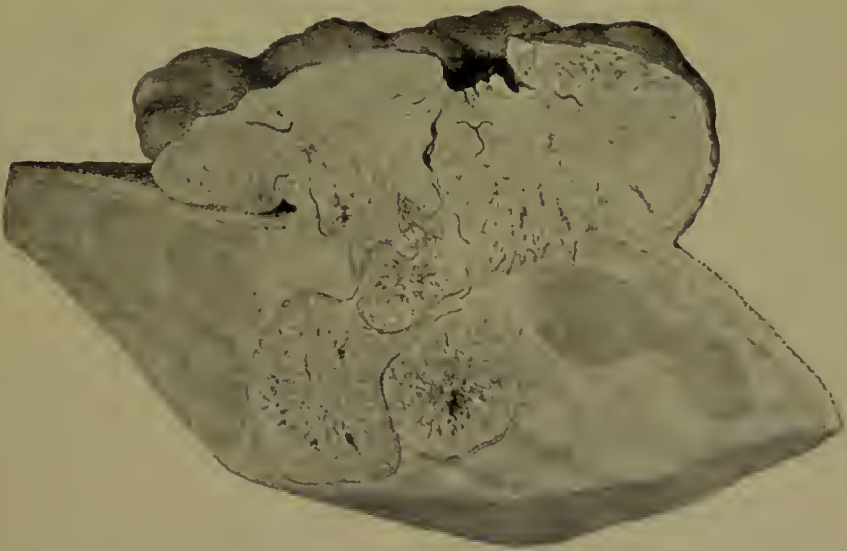

FIG. 19.—Epithelioma of nipple growing downwards into the breast. From a specimen in the Royal College of Surgeons.

A case of sebaceous cyst of the mamma, as large as a hen's egg, removed by M. Gerelly, is related by Velpeau. Another large sebaceous cyst was removed by Laurence and examined by Paget in the Museum of St. Bartholomew's Hospital, but I cannot certainly identify the specimen. No. 3188 in this museum is a sebaceous cyst from the skin of the mamma which before removal was thought to be a tumour growth. There were other sebaceous cysts on the scalp.

The following is an excellent example of sebaceous cyst of the skin over the breast:—

A single woman, aged thirty-five, was admitted into St. George's Hospital in April 1880. She had noticed a "small lump" at the lower part of the left mamma for several years. It had increased slowly, but had given her no pain. Eight months ago it began more rapidly to increase in size. At the lower part of the breast was a growth, of which a rough sketch is given in the notes, oval in shape, and about one and a half inches in its long diameter. The skin was thin and florid over the growth, which was "of the consistence of putty." The tumour was situated in the skin, and white chalky material could be seen through its thinned capsule. It was removed by the late Mr. Rouse, and proved to be a sebaceous cyst.

A well-marked sebaceous cyst was removed by Mr. Dent from the skin of the breast of a woman, aged fifty-seven, at St. George's Hospital in April 1885. It was the size of a cherry, and marked with a black punctum which enabled the diagnosis to be made. This little cyst was situated on the axillary aspect of the mamma.

Bryant alludes to a case of this nature where the sebaceous cyst, which was situated near the areola, broke down and fungated, and ultimately became the seat of epithelial cancer.[1] Such a condition ranks among the rareties of pathology.

My colleague, Mr. Turner, mentioned that he had removed a sebaceous cyst from the breast of a married lady, aged thirty. The swelling had been pronounced "malignant" by experienced surgeons.[2]

Lupus.—Patches of lupus vulgaris may occur on the breast, and are amenable to scraping, caustics, or excision. I have once seen lupus erythematosus in this situation, associated with patches of the same disorder in the scalp. It must not be confounded with "Paget's disease" of the integument.

Molluscum Contagiosum.—The well-known pearly white

[1] *Diseases of the Breast*, p. 332.

[2] *Med. Soc. Trans.* vol. xix. p. 94.

tubercles of molluscum contagiosum are sufficiently common on the breast and about the areola. Should a child be suckling, its cheeks and eyelids will probably also exhibit the disorder. When the tubercles are large and ulcerate, I have known them taken for chancres. They may be touched in the centre with acid nitrate of mercury, or pure carbolic acid.

Molluscum Fibrosum.—The mammæ may be involved in cases of this disease. Large flaps of hypertrophied tissue, forming about the thorax, may implicate the region of the breasts. The treatment presents nothing peculiar.

Neuroma—Painful Subcutaneous Fibroma.—These small growths, so familiar to surgeons under the skin of the arms or legs, are more rarely found in the mammary region. They consist of fibrous tissue and fat, and are not true nerve tumours. The extraordinary neuralgic pains and tenderness evidenced by these little growths is, as might be expected, exaggerated in the mamma. Great mental anxiety is also expressed regarding them. The least touch causes pains like "electric shock" to shoot over the chest and down the arms. The growth may be no larger than a barley-corn, and yet occasion the most distressing symptoms, and some cases described as violent neuralgia of the breast, are doubtless due to the presence of one of these little bodies which, from their small size, are readily overlooked.

The treatment consists of excision under anæsthetics.

A married woman, aged forty-three, came to the out-patient department of St. George's Hospital in March 1895, and said she believed she had a cancer in the left breast. She had one child, many years ago, and suckled it. Nothing was wrong until two years ago, when she began to suffer from acute pains in the axillary margin of the left breast. She handled it excessively, and often rubbed it with various liniments and embrocations, and at last persuaded herself that she found a tumour. Two doctors whom she consulted agreed in this opinion. On examination the nipple and skin of the breast were normal, and there were no enlarged axillary glands. Careful examination failed to discover any tumour, but there was marked hyperæsthesia and pain on handling the axillary part of the breast. At last a small nodule, the size and shape of a grain of barley, was felt under the skin. On pressure over this, severe shooting pains were experienced down the arm and over the thorax and neck. It was obvious that this was an instance of the painful subcutaneous tumours so often found in the arm. On 21st March the little growth was removed by Mr. Gardner, the then assistant house-surgeon, by the aid of cocaine. Under the microscope it consisted entirely of fibrous tissue. The patient was completely relieved of her symptoms by the operation, but the true nature of the case might readily have been overlooked.

Erythema.—The various forms of erythema may affect the skin over the mamma and present nothing peculiar. Especial attention may however be drawn to the so-called erythema gangrenosum occurring in this vicinity. Hitherto this curious affection has been found in hysterical females, and parts of the thighs, breasts, and arms have been affected. Such patches are manufactured with strong acids and caustics, concealed with surprising skill by the patient, who is impressed with the wilful desire to deceive, and create an interest in her otherwise obscure existence. Often no motive can be assigned, but these cases have completely deceived surgeons of experience and eminence, and probably will do so again.

Ecchymosis of the Breast.—It occasionally happens that discoloured patches like bruises analogous to conjunctival hæmorrhages are observed in the skin of the mamma, especially in young chlorotic girls whose menstrual functions are disordered. These are usually called "spontaneous." Reflecting, however, how readily cutaneous hæmorrhages take place in delicate skins, and how the breasts are easily subjected to slight contusions, or frictions, concealed or unnoticed, it is possible that in many of these cases the term "spontaneous" is not a good one. The affection is alluded to by a variety of authors, among others, A. Cooper, Velpeau, Nelaton, and Tillaux.

I have seen spontaneous ecchymosis of the skin of the breast, in association with cystic sarcoma on two occasions, once with scirrhus, and once with duct carcinoma. The marks appeared in these cases so suddenly and erratically, that the question of injury was not to be thought of. In one case the marks of "bruising" on the front of the skin of the breast, drew attention for the first time to the existence of a tumour.

The application of an evaporating lotion is all that is requisite. Should a malignant tumour coexist, the treatment of such a condition must be considered. Care must be taken to determine that the hæmorrhages in the skin of the breast are

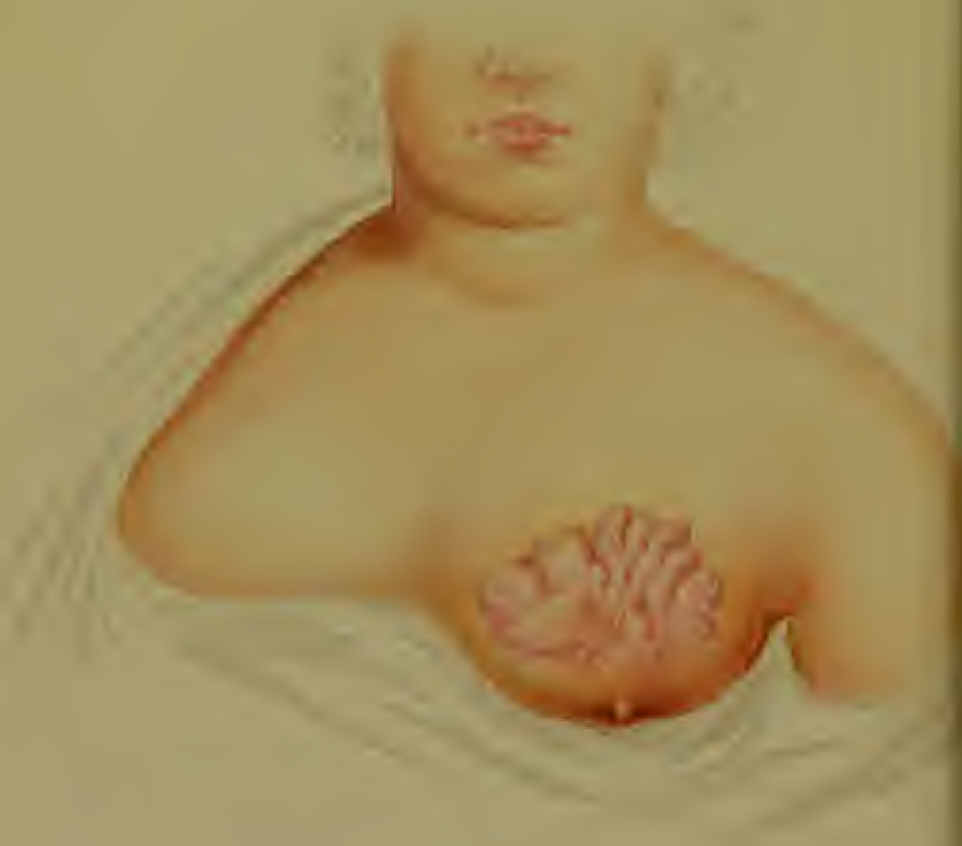

PLATE VI.

Keloid of the skin of the mamma simulating hard carcinoma.

To face

not symptomatic of some serious blood disease, as pernicious anæmia, leucocythæmia, or the graver disorders of the blood associated with sepsis.

Keloid.—The well-known white or pinkish, flat, discoid tubercles, with claw-like processes, of keloid may form on the skin of the breast in the scars of incisions for abscess or tumour. In the days when "tartar emetic" ointment was applied for chest affections, keloid would sometimes attack the resulting skin scars over the breasts. Thus a case is related by B. Philipps, when a woman had seven of these tumours on one mamma, and five on the other. I mention the occurrence of this disorder to prevent the surgeon mistaking it for carcinoma which it superficially resembles. No one who has seen keloid of scars will have any difficulty in recognising it.

Williams, in an excellent paper on keloid of the breast in the *Medical Chronicle*, 1893-1894, relates a case of keloid the size of a pea, originating in the scar of a boil on the left breast.

Mr. C. Heath refers to a case of keloid of the breast in a lecture published in the *Lancet*, 6th May 1871. He showed the case to the late Mr. Charles Moore, a good authority on diseases of the mamma, and the latter was inclined to believe it to be scirrhus. A case of keloid attacking the breast was related by Addison in his original paper. It is interesting to observe that the disease followed upon the discharge of an abscess, and we can hardly doubt but that the affection attacked the scar. It was curious, however, that tubercles of it were scattered about the skin and on both breasts. Addison's second case was on the skin of the left breast of a man, aged thirty-seven, who was sent to Mr. Bransby Cooper by one Whatcley, a surgeon of Berkhamstead. The case was several times submitted to operation.

Some years ago at St. George's Hospital a mother and daughter were out-patients under my care with keloid growths over the skin of the breasts, which had followed the application of a strong acetic acid liniment. The daughter had three keloid discs over the skin of the left mamma, which were the size of a shilling. They were very unsightly, and only slowly lessened in size. At consultations at St. George's on 27th January 1897, Mr. Haward showed a woman, aged forty-five, with carcinoma of the left mamma. There were two pinkish hard nodules in the skin, which at first sight looked exactly like deposits of carcinoma. The woman assured us that they had grown in the scars of two burns, which she had upon the part many years before. They were certainly keloid, and their recognition had an important bearing on the operative treatment of the case.

Morphœa and Scleroderma.—These affections may occur upon the skin of the mammary region, in broad bands and patches, white, and margined by telangiectasis. "Itching and burning" is experienced, the integument is smooth, stiff, and, especially in scleroderma, definitely thickened. Extensive patches of scleroderma in this region are apt to be confounded with cancerous infiltration (cancer en cuirasse). I have even known operation suggested. The differential diagnosis is to be made by observing the essential features of the malady. Infiltrating cancer is usually secondary to a nodule of the disease occurring primarily in the breast, or in an axillary accessory mamma. The skin in cancer is livid and abundantly mottled with venules. Œdema of the arm is usually observed in 'cancer en cuirasse,' from glandular infection, and cutaneous nodules with enlarged glands generally coexist.

A case of extensive scleroderma in a broad band below the left mamma was shown by Pringle at a meeting of the Dermatological Society of London on 14th April 1897. I examined this case, and its diagnosis presented no little difficulty. On 29th April 1897 I saw also an aged man shown by Dr. Abrahams at the Dermatological Society of Great Britain. The left breast had a deep fissure upon it caused by a sclerodermic band, which extended nearly from the sternum to the axilla. There was a similar band upon the abdomen. The "bands" were associated with severe itching and burning. They were undoubtedly sclerodermic. The axillary glands were not affected, the arm was not œdematous, there were no nodules in the skin and cancer was negatived.[1]

Sarcoma of the Skin over the Mamma.—A woman, aged thirty-nine, was admitted into St. George's Hospital in February 1891, with a small superficial tumour in the skin of the upper part and axillary margin of the right mamma. She stated that she had suffered from abscess of the breast fourteen years before. For no less than fifteen years she has noticed a small lump in the situation of the present growth. It has gradually increased in size, and has been attended with "shooting pains," while the skin over it has become reddened. The tumour was described as about an inch long, and half an inch broad. It was freely movable, and did not involve the subcutaneous cellular tissue. The skin was reddened, smooth, and adherent; the breast was normal, and the axillary glands not affected. An abdominal tumour was also discovered, which was not operated upon, but which presented many of the characters of ovarian disease. The tumour of the skin of the breast was removed. Microscopical examination by Professor Delépine showed that the tumour was a spindle-celled sarcoma, beginning in the true skin.

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[1] For sclerodermic grooves on the breast, similar to above, see *Guy's Hosp. Reports*, 1869-70, p. 302.

The largest sarcoma of the skin over the breast I have ever seen, is preserved in the Museum of the Royal College of Surgeons (4788). This is a vascular, tuberous-looking growth of the size and appearance of a large tomato, with a thick neck or stalk. It was taken from a lady, aged sixty-one; thirteen years previously it had been removed as a small nodule, but returned in the scar. As might be expected, the tumour was of the "spindle-celled" variety. A pedunculated fibromatous growth, which took on sarcomatous action, is reported by

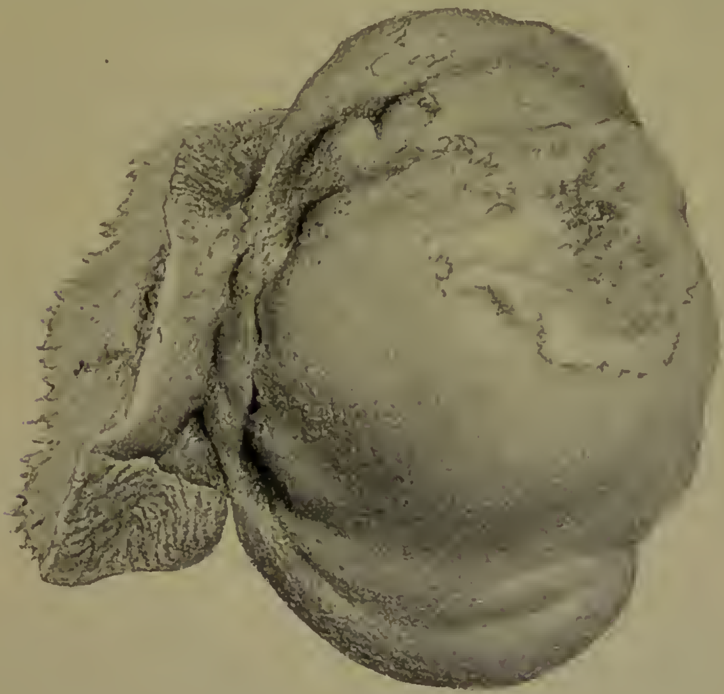

FIG. 20.—A large spindle-celled sarcoma of the skin over the mamma. From a specimen in the Royal College of Surgeons.

Wheeler of Dublin.[1] It formed just below the mamma, and measured 8 inches in length by 4 in breadth.

Warts and moles may occur upon the skin of the mamma, and, as in other situations, the moles may take on melanotic degeneration. This must not be confounded with true melanosis of the breast itself, one of the rarest of maladies. Bryant refers to two cases when melanotic moles in the axilla, were associated with infiltrating carcinoma of the breast. So far as I have been able to ascertain, this interesting association has not been noted by others, and I have never seen an instance of it. I should be inclined to look upon it as coincidence.

Velpean saw two cases of melanosis of the mammary region. The skin was severely affected, and both patients died with multiple tumours of the viscera.[2] It does not appear that the true breast substance was affected.

Nunn also mentions a case of melanosis of the skin over the breast which seems to have commenced in a wart.[3] In this connection attention may be drawn to specimen 4819 in the Museum of the College of Surgeons. Here the skin over a carcinomatous growth is covered with warty papillomata.

All such affections of the skin of the breast must be treated on ordinary principles; and free excision must be carried out in those which are like to recur, as melanotic warts. Keloid must be protected and left alone.

Should any surgeon be tempted to remove a keloid growth from over the mamma, let him ponder over this account of a case related by Simon (*Path. Soc. Trans.* vol. xxv. p. 306).

"I remember a great many years ago to have removed from the top of a lady's chest a little fibroid tumour. She had had the disease removed before, but it had come back again ; and now in removing it I went widely into the surrounding parts and brought the edges together with three harelip pins. A few weeks afterwards I found that the tumour was growing again, and that in addition each of the six pin-holes was giving rise to a little fibroid growth of its own. Eventually the growths all shrank under the use of ice, and the lady, now approaching middle life, has had no subsequent inconvenience."

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[1] *Medical Press and Circular*, 1889, vol. xlvii. p. 217.

[2] *Diseases of the Breast*, p. 367.

[3] *Cancer of the Breast*, p. 105.

PAGET'S DISEASE OF THE NIPPLE—MALIGNANT PAPILLARY DERMATITIS—SUPERFICIAL CARCINOMA OF THE SKIN

This peculiar malady essentially consists in a chronic affection of the nipple and areola, associated with thickening of the skin, epithelial proliferation, and desquamation; it terminates in a peculiar form of cutaneous carcinoma, and the formation of a vivid crimson, raw, glazed surface, with a curiously defined border of a brownish hue. The affection in some of the more marked cases is followed by ulceration and even destruction of the nipple. In a large proportion of the cases carcinoma of the mamma supervenes. The peculiar vacuolated cells found on histological examination have been declared by competent observers to be encapsuled coccidia, psorosperms. I had an opportunity of seeing a case of this affection affecting the skin of the scrotum shown by Crocker.[1] In the *Dermatological Journal* for 1897 I related a truly extraordinary case, where this disorder supervened upon a patch of chronic skin disease over the pubes in a male aged sixty. Two large epitheliomatous growths also formed upon the raw surface.[2] Again H. Morris[3] has recorded a case following upon a patch of chronic eczema of the neck which appears genuine "dermatitis maligna." Other observers, including myself, have seen the affection upon the glans penis, so that it is not confined to the female breast.

It is worthy of remark how near Velpeau came to recognising this disease. He speaks of the wife of a distinguished dentist of Paris, in whom *Eczema rubrum* was accompanied by lancinating pains and redness, with thickening and induration of the skin to so great a degree, that the idea of it being a cancerous affection was entertained. At last the disease in this case became amenable to simple remedies.[4]

Clinical Description.—No better description of "malignant dermatitis" has ever been given than that of Paget, who first drew attention to it in 1874. A woman, probably of the cancerous age, is conscious of burning and irritation about the nipple, which is surrounded by a bright red patch, covered by scales which may be picked off, leaving a raw surface beneath. The process extends centrifugally until the whole of the areola is involved. Finally, ulceration takes place about the base of the nipple, until the whole nipple may be destroyed. This is not an invariable termination.

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[1] *Path. Soc. Trans.* vol. xl. p. 1868.

[2] See a paper on this, and another case by Rolleston and Hunt, *Path. Soc. Trans.* vol. xlviii. p. 211.

[3] *Med.-Chir. Trans.* vol. lxiii.

[4] *Diseases of the Breast*, p. 4.

A case illustrating destruction of the entire nipple is quoted in the *Medical Chronicle* for 1895, p. 128. It was related by Depage.

A woman, sixty-two years of age, who had an abscess of the breast incised thirty-five years before, came under notice, with an ulcer of the right breast, intensely red at the margins, white and dry in the centre. It had existed for twelve months, and the nipple had been entirely destroyed, its site being occupied by a deep hollow. Cancerous nodules were found in the surrounding skin. Dr. Depage discusses the nature of this case, and does not regard it as one of Paget's disease, but one of glandular cancer originating in the nipple.

A similar case, where the entire nipple was destroyed by ulceration, is as follows:—

A married woman, aged sixty-two, was admitted into St. George's Hospital in April 1885 under the care of Mr. Holmes. For four years the left nipple and areola have been "sore." For four months ulceration has taken place, gradually destroying the nipple. The ulcer is described as circular, 2 inches in diameter, and with hard everted edges. There are enlarged and hard glands in the axilla, and some indurated tissue beneath the ulcer. Microscopically the diagnosis of "encephaloid" carcinoma was made after removal of the entire mass.

Sir James Paget described the condition of the surface as resembling a very acute eczema, "or like that of an acute balanitis." The latter simile is very exact, and indeed a similar condition on the glans penis may be the precursor to epithelioma of that organ. The borders of the patches are usually sharply defined, and this is an important distinguishing sign from true eczema. The discharge is sticky, viscid, and of a yellowish colour drying into scales and crusts, and in several cases seen by myself, white islets of epidermis are scattered over the surface here and there. In those cases where the desquamating scales somewhat simulate psoriasis, the affection may spread far beyond the areola in circles, or with

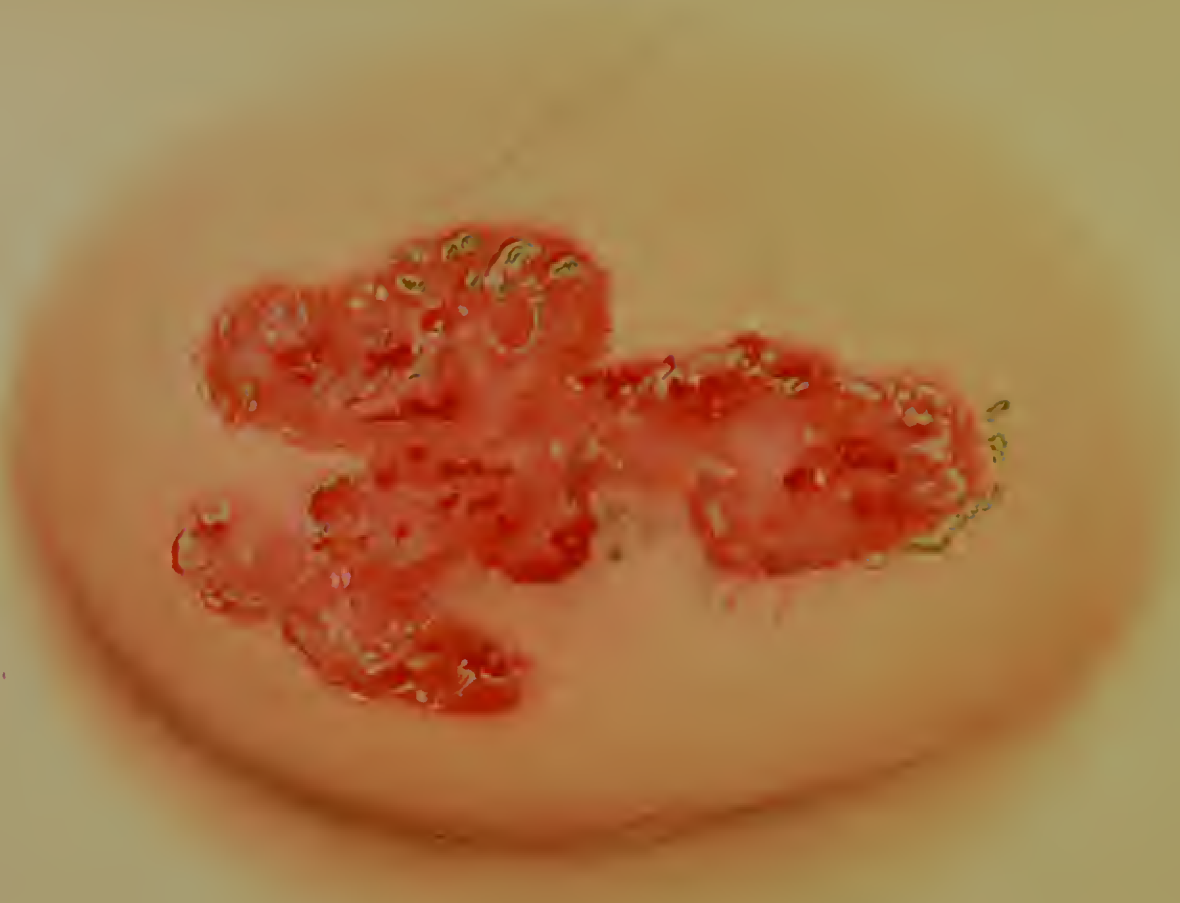

PLATE VII.

scattered blotches of redness covering nearly the whole breast. This is, however, unusual. A "scraping" of the surface, well soaked in liquor potassæ, may show the vacuolated cells termed psorosperms. All evidences of these bodies, and deductions drawn from them, must at present be looked upon with peculiar caution. In the cases of "dermatitis," observed by Paget, "hard cancers" of the breast supervened. This is not universally the case, and the proportion of those who suffer from tumours is hard to make out. Out of 23 cases collated by Bowlby[1] 14 suffered from cancers, 9 escaped. It is impossible to be sure, however, that in an instance of this disease, where no cancer exists, such might not ultimately form, should the case be left to take its course, and the patient live long enough. The duration of the disease in Bowlby's cases when no tumour appeared, varied between six months and as long a period as twenty years. In the 14 cases when cancer ensued, the period of time before operation varied from fifteen days to twelve years. The age at which patients are affected was much that of cancer of the mamma generally. The youngest was thirty-six, the oldest sixty-four. It is especially to be remarked that these cases are in no way directly associated with lactation or other causes of irritation, such as produce ordinary eczema, from which the affection differs very widely. The affected skin is always infiltrated, and if a portion of it be lightly pinched up between the finger and thumb, the parchment-like thickening is readily appreciated. Next to the peculiar appearance, thickening of the skin may be looked upon as one of the most important diagnostic features of the disease.

I was surprised to find from the records of St. George's Hospital how rare undoubted cases of this affection really seem to be. Out of the 400 cases of carcinomata examined at St. George's, only 5 occurred where one could be certain that this malady really preceded the cancerous growth. In T. Jones's carefully collected series of 55 cases of cancer of the breast, reported in the *Lancet* for 31st August 1895, only 2 instances of "inveterate eczema" were observed to precede the occurrence of the carcinoma. Gross observed

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[1] *Med.-Chir. Trans.* vol. lxxiv.

5 cases in 370 instances of cancer; Bryant only 3 in 600 cases, far less than 1 per cent.

Morris stated at a discussion at the Medico-Chirurgical Society, that out of 215 cases of mammary cancer carefully observed by him at the Middlesex Hospital, not one suffered from preliminary dermatitis of the nipple. In 7 instances of "eczema" of the nipple he had observed, cancer did not follow.[1]

The same surgeon found only 2 instances of malignant dermatitis of the nipple, in 305 cases of carcinoma of the breast.

These statements leave us with the following conclusions:—

(1) That the disease is rare, and the diagnosis difficult and not uncommonly erroneous.

(2) That it is usually but not certainly followed by carcinoma of the mamma.

(3) That, as is usual with rare maladies, the life experience of one man hardly suffices to become acquainted with all its forms and terminations, and hence unless we consider the experience of many, we can hardly strike an average of symptoms and terminations.[2]

Personally, after carefully considering all the descriptions of the microscopical characters of this disease, and some of them are very conflicting, I have come to the conclusion that the name "superficial carcinoma of the skin" would be very appropriate. There can be no doubt that were one able to study a long series of cases, curious differences might be observed in the characters of these anomalous forms of carcinoma. The spread of the malady into the mamma by way of the ducts seems clear enough.

Histology.—The minute anatomy of this malady has been studied and elaborated by Butlin and Thin in this country, by Darier and L. Wickham, by Duhring and Wild. Many other competent and able observers have investigated the subject, which is surrounded by especial interest, since Thin, Darier, and after them L. Wickham, described the vacuolated cells observed in the sections of the skin as parasitic psorosperms or encapsuled coccidia.

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[1] *Lancet*, 27th January 1877.

[2] *Ibid.*, vol. ii. 1879.

The present aspect of the histological changes in Paget's disease may be thus summarised.

The affection at first resembles an inflammatory process. There is marked epithelial proliferation in all the layers of the rete with desquamation, and deep infiltration of the subcutaneous tissues with small cells and leucocytes. Between the epithelial cells are seen many migratory branching cells. The adjacent ducts and acini also become stuffed with proliferating epithelium, and this is a very marked feature of the disease. Great stress has been laid by Wickham and Duhring among others on the intensity of the process in the papillary layer of the skin. So marked are the papillary ingrowths, that many excellent observers have pronounced the change to be epitheliomatous. It may be remarked that like appearances are often seen on the edges of old ulcers, especially in those ulcers of the leg which are of long standing, and where the granulations are exuberant. Some authors have described spindle-shaped cells separating the epidermal elements.[1] As seen in the section, dermatitis of the corium is very marked.

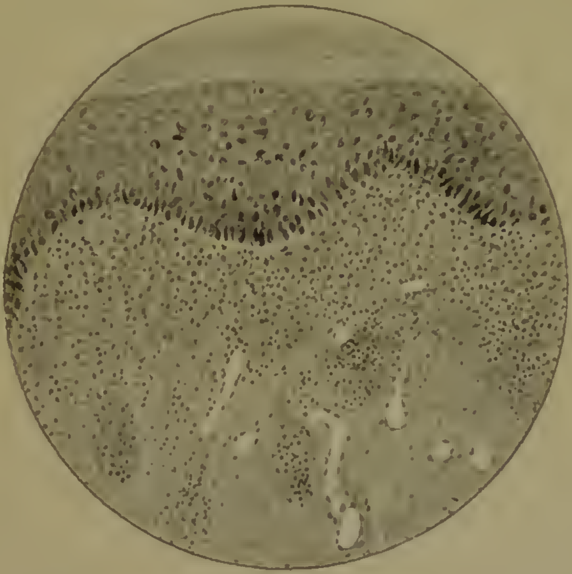

FIG. 21.—Microscopical appearances of dermatitis maligna under a low power. The down-growth of small cells into the rete is well shown. From a specimen prepared by Mr. Jackson Clarke.

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[1] Butlin, *Med.-Chir. Soc.* 11th January 1876.

Towards the centre of the patch much desquamation and destruction of the superficial layers has taken place leaving the surface very raw and sticky. The pathological changes seem to terminate sharply at the border, and this has a most important bearing upon the question of excision. In some places prolongations of large epithelial cells of a squamous type extend deeply into the corium, and thus alveolar spaces are found stuffed with such cells bearing a close relationship to true epithelium. Personally, being guided rather by clinical motives, I would look upon this affection as a form of epithelial cancer of the skin, and for all purposes of treatment it had better thus be considered.

The questions now arise: (1) Are the large vacuolated cells of epithelial appearance found in the scrapings and sections parasitic psorosperms? (2) If this is acknowledged, what relation do they bear to the production of the carcinoma?

There are at least five diseases in which psorosperms, or bodies resembling these protozoa, have been claimed to originate: (1) Epithelioma; (2) Molluscum contagiosum; (3) Paget's disease of the nipple; (4) Darier's disease (Psorospermosis follicularis); (5) Rodent ulcer.

Professor Delépine, in a most admirable paper on the subject of psorosperms in vol. xlii. of the *Pathological Society's Transactions*, fully describes the characters of these bodies. A reference to this paper is needful for those who wish to study the matter in greater detail. The essential point, perhaps, in the microscopical characteristics of these bodies, is a double contour due to a space between the ectosarc and contractile endosarc. The organism is distinctly contractile and alters its shape, being often flat on one side, globose on the other. As Delépine points out, these bodies are most widely distributed all over the animal kingdom.[1] It is especially important to remark, that they have not satisfactorily been shown to give rise to any malignant form of tumour. They are associated with papillary outgrowths in the bile-duct of rabbits.[2]

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[1] The best examples I have seen have been in the intestines of earth-worms.

[2] Besides papillary growths in the bile-ducts of rabbits, Nocard describes tumours in the intestines of sheep (*Journal of Pathology*, vol. i. p. 404). Psorospermial cysts in ureter, bladder, and kidney, have been also described (Eve, Silcock, and others).

The histological battle as to whether the peculiar cells found in Paget's disease are or are not psorosperms, has been perhaps too acute, and pages might be filled with the rival views of different observers. The question is purely one for the interpretation of microscopical appearances. Very cautious and accurate observers have been unable to distinguish the double contour and contractile nature so characteristic of psorosperms, in the large vacuolated cells of Paget's disease.[1] On the other hand, it is so confidently asserted that these bodies exist in this malady, that perhaps the balance of opinion is in favour of their occurrence. If the scrapings be examined in liquor potassæ under a high microscopical power, the psorosperms appear as bright and nucleated bodies surrounded by thin capsules, or contained in larger (host) cells.[2]

Assuming that psorosperms occur in malignant dermatitis, what relation do they bear to the causation of cancer? The arguments against cancer being caused by these organisms may be thus tabulated :—

(1) Psorosperms found in animals, or in the liver of human beings, are not associated with cancer or tumour growth.

(2) In the large number of cases of carcinoma of the breast, which occur without antecedent disease of the nipple, these organisms are not found, and they are not present in the secondary growths in the glands.

(3) In a certain proportion of cases of malignant dermatitis, no cancer of the mamma has followed, though the malady has been of very long standing.[3]

I am cognisant of the fact that some observers have found these bodies, or assert they have found them, in breast carcinomata and even in sarcomata, and regard them as the direct specific cause of cancer; but the general balance of opinion of those, whose microscopical researches are tempered by the knowledge of human fallibility of observation, is on the side of doubting that psorosperms are found usually in carcinomatous growths themselves. At the same time the presence of these bodies in malignant dermatitis can hardly be quite due to chance, and may possibly be better explained when we know more of the natural history of the parasite. The clinical appearances of this disease in typical cases are so striking, and utterly unlike any other cutaneous disorder, that I feel confident there is a definite pathological explanation, and this may yet be found in the undoubted demonstration of some parasitic element.

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[1] Bowlby, *Med.-Chir. Trans.* vol. lxxiv.

[2] According to Morrow the presence of these cells negatives eczema in which they do not exist. He advises placing the scrapings in a 2 per cent solution of ammonium bichromate for several days. They are then washed, stained in hæmatoxylin, and mounted in balsam.

[3] Thus Jamieson has related a case of twenty years' duration, *Diseases of Skin*, 4th ed. p. 537.

Many German writers believe that the so-called cancer organisms are really cell processes, cell inclusions, or cell degenerations. Fabry[1] in a lengthy article refers to these cases. His article is commented upon in the *British Journal of Dermatology* for December 1894. He concludes that the question of the relation of psorosperms to cancer is a very open one. He cites a case of "Paget's disease" of the nipple, which he cured by salicylic lotion, painting with thiol, and the application of a zinc-gelatine dressing. This authority distinctly inclines against the view of cancer organisms.

Two cases also are related by Chambers[2] where chronic eczema about the nipple of a very obstinate and abiding nature was cured by the application of a lotion of equal parts of tincture of opium and glycerine. He draws attention to the importance of examining for uterine disease in these cases. Chambers's cases were probably not true dermatitis of a malignant type.

Thin, after elaborately describing the histological appearances in a case of duct carcinoma,[3] summarises the changes observed by him as follows:—

(1) The affection of the nipple is not eczema or any known skin disease, but a destructive dermatitis of the papillary layer.

(2) The breast tumours consist of epithelial growths, which take their origin from the epithelium of the lactiferous ducts, and which retain the specific characters of that epithelium.

(3) A complete account of an instance of the scirrhous or parenchymatous type of cancer in connection with this affection, has not yet been published.

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[1] *Archiv. für Dermat. u. Syph.* February 1894.

[2] *Lancet*, 1879, vol. ii. p. 743.

[3] *Path. Soc. Trans.* vol. xxxi.

(4) A local affection of the points on the surface of the nipple, which corresponds to the mouths of the lactiferous ducts, has preceded, in well-observed cases, the extension of the disease over the nipple and areola.

He concludes by supposing that a change takes place in the columnar epithelium near the mouths of the ducts, and this propagates an abnormal growth of the duct epithelium.

Sir James Paget[1] long ago pointed out that the cancers were of the usual hard kind, and subsequent observers have confirmed his observation. They seem to run the usual course of the common hard carcinomata though being of the duct variety. Probably in the larger ducts, the type is that of squamous carcinoma, in the smaller ducts, of columnar carcinoma, and deeper still of acinous cancer, the type of cell changing with the depth of the growth. Consequently the carcinomata in connection with "dermatitis maligna" may be rather mixed in structure.

The opinion of Thin that the growths are duct cancers has indeed been much controverted. His arguments are, however, carefully advanced, and his paper is well worth careful study. I am inclined to support his views. Some of his cases closely resemble duct papillomata, becoming foliaceous, and forming adenomatous tumours. Gross too relates a case of spindle-celled sarcoma of the breast, where the woman suffered from "psoriasis" of the nipple for nearly thirty years. I am not clear that this was a case of true malignant dermatitis.[2]

It may be mentioned that Paget's disease is not unknown as a precursor of cancer in the breast of the male, for a patient was shown at the Glasgow Clinical Society on 10th May 1880, by Dr. Forrest, which was the first recorded case where eczema was associated with scirrhus of the male breast.

There is also a specimen to illustrate this disease in the male in the museum of the Royal College of Surgeons, but the specimen is not a well-marked one.

Treatment.—It is of the first importance to diagnose between chronic eczema and true "malignant dermatitis," for the former is amenable to local remedies, the latter is not. True malignant dermatitis has hitherto proved very rebellious to all local measures, though possibly the anti-parasitic remedies now so fashionable in dermatology may have some effect upon this obstinate disease. I have never known a genuine case of "Paget's disease" truly cured by local remedies, and suspect that reported cases beneficially influenced by remedies have been really patches of chronic eczema, for the distinction between these affections is by no means always clear or easy. There can be no objection in cases of doubt to apply the local remedies for eczema, but considering the frequency with which these cases are associated with the formation of carcinoma, no time should be wasted if the case proves obstinate. Should infiltration or commencing nodulation at the base of the nipple be certainly present, complete extirpation of the breast should at once be carried out. The axillary glands should also be thoroughly removed. The destruction of the nipple and adjacent parts with caustics has found favour with some dermatologists, but I should doubt if such treatment is safe or advisable in this affection unless the patient should absolutely refuse excision.[1] Objections to caustic treatment are, that the ducts being obstructed by the healing, cysts are apt to form, and one cannot certainly tell how far the dangerous proliferation of the epithelium has already extended down the ducts or into the acini. Surgeons who have used the caustic treatment have too hastily assumed that they have prevented cancer by their treatment, whereas there is ample evidence to show cancer by no means follows, and the period of its development is very uncertain.[2]

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[1] *Lancet*, 27th January 1877.

[2] *Tumours of the Breast*, p. 31.

It is probable also that excision of the nipple and areola, or nipple alone, without removal of the breast, is not sufficient to ensure the patient against the after-formation of cancer. A most important case bearing upon this point is related by Munroe. A lady, aged fifty-eight, had a trifling but chronic and intractable sore on the summit of the left nipple. The sore was covered by a yellow crust, and when this was removed there was a "reddish vascular appearance." Palliative treatment having failed, the nipple was excised by the advice of the late Professor Spence. All went well for twelve months, when a tumour the size of a marble was found in the upper and inner part of the mamma. This proved to be of a scirrhous nature.[1] Duhring's two cases[2] are noteworthy, as showing the obstinate resistance of this disease, when well established, to any remedies short of actual extirpation. The pyrogallic acid ointment, in the proportion of two and a half drachms to the ounce, was applied, and acted as a caustic with temporary good results. But when the wound granulated all the symptoms recurred, and recourse was had to the sharp spoon, again with no more than temporary benefit. Excision was proposed, but refused. This account will be useful to the practitioner who meets with these cases, as showing him the disappointing results of non-efficient remedies. In very rare cases the affection may spread extensively over the skin of the thorax. The possibility of a tertiary syphilide attacking the areola and integument of the mamma must never be forgotten. I have on several occasions known such cases to be erroneously diagnosed as malignant dermatitis, and thus my suspicion is strengthened that recorded cases of recovery of the latter affection under simple applications, have been usually diagnostic errors.

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[1] Crocker advises the use of chloride of zinc paste. A 40 per cent ointment of pyrogallic acid may be used afterwards.

[2] *Lancet*, vol. i. 1882, p. 684.

A most remarkable case of carcinoma of the areola and skin, was under my care in St. George's Hospital in September 1896. The patient was a woman aged forty-five, married, with a family. Her face was marked with acne rosacea, and tufts of enlarged venules with two nævoid-looking tubercles. Her hair was of a peculiar auburn tint, and the history of her case was curious. Eight years before, she had an abscess in the right breast after suckling. The opening "scabbed over" but never quite healed, and the disease of the skin started from this point, and not from the nipple. Of this she was certain. The disease gradually spread, and involved the nipple, with severe burning and smarting. During the last six months it has made rapid progress.

On inspection, the whole skin of the right mamma and side of the thorax was converted into a raw granulating sore of typical appearance. It was of a vivid crimson, glazed in parts, and an alkaline, clear, viscid, offensive discharge abundantly exuded. The nipple was quite destroyed. Small white islets of epithelium were found scattered over the raw area. In the site of the ancient abscess sinus, was a fungating carcinoma the size of a walnut. The axillary glands were not affected

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[1] *Glasgow Med. Journ.* 1881.

[2] *American Journ. of Med. Sciences.*

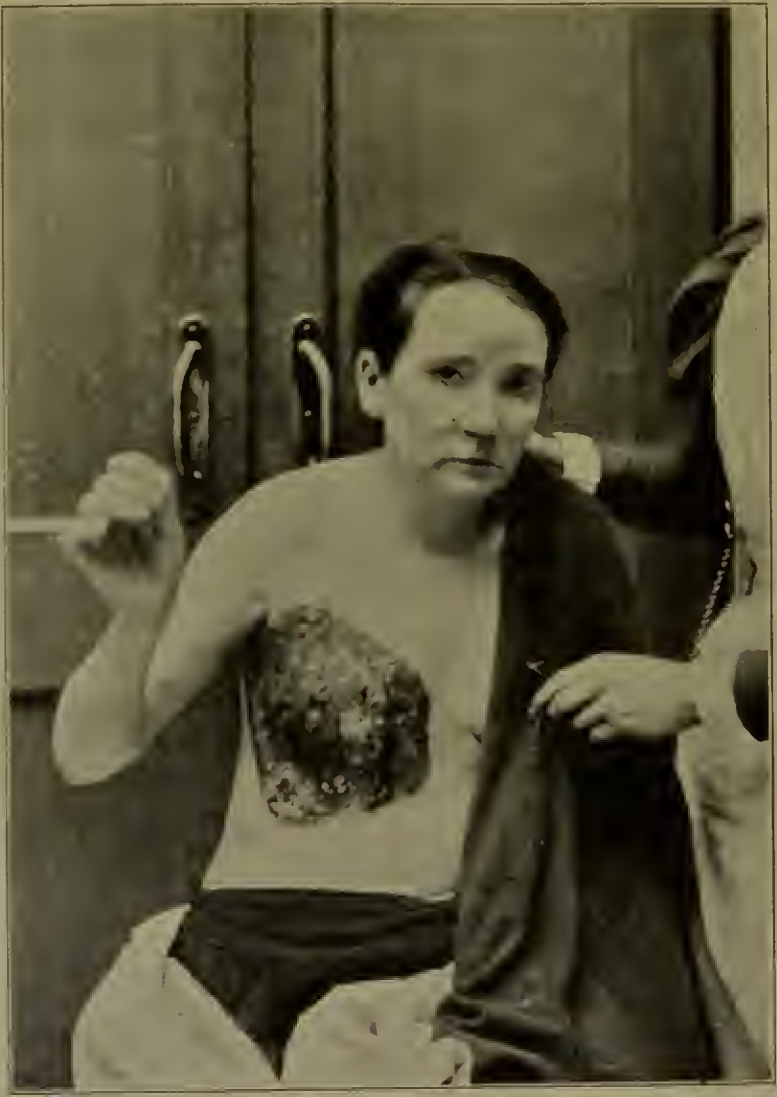

FIG. 22.—Dermatitis maligna of eight years' duration covering the side of the thorax.

so far as could be ascertained. The margins of this extensive patch of disease were definitely outlined, as though it had been branded upon the chest. Characteristic thickening could be felt on "pinching up" the skin. To give some idea of the extent of the disease I measured it when she left the hospital. It was 10 inches in vertical extent, 11 inches from before backwards, and reached round the posterior flap of the axilla. The patient would consent to no radical treatment. Scrapings were examined by Dr. Rolleston and my friend Dr. Galloway. Bodies resembling psorosperms were abundantly found. We hesitated to pronounce them as such.

This patient returned to the hospital and begged for treatment in March 1897. Accordingly, not without serious fears at the magnitude of the operation, I removed the whole ulcer, the mamma, and the pectoral muscle. The wound was of huge size, measuring 14 inches by 12, and no attempt could be made to bring the edges together. Skin-flaps about 4 inches long were raised, and sewn down with catgut upon the surface of the wound. So soon as cicatrisation was advanced, this process was repeated, and by June 1897 the great wound had healed with a soft cicatrix. The constitutional and local relief was extraordinary, but probably temporary.

One indurated gland was found in the axilla. It contained a squamous-celled carcinoma modified by marked degenerative changes. The breast was atrophied, and repeated sections failed to show any signs of carcinoma. Microscopically the skin showed remarkable changes, being really converted into a huge superficial epithelioma, but the mamma beneath was free of carcinomatous disease.

A case much resembling this in many of its details was shown by Paul.[1]

In a woman of forty-three the whole breast area was converted into a red, raw, granulating surface, produced by the coalescence of numerous small ulcers. At the periphery were little patches of erythematous skin. On palpation the gland itself felt hard and shrunken. The nipple was swollen and excoriated. After removal and microscopical examination, Mr. Paul found that the axillary glands and mamma were affected with ordinary acinous carcinoma, and that the cutaneous affection was due to lymphatic infection of the skin, with active inflammatory irritation.

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[1] *Liverpool Med.-Chir. Rev.* 30th November 1891, p. 231.

Many surgeons who saw this case believed it to be of the nature of Paget's disease of the skin, but the author did not take this view.

The following remarkable case is quoted by Schulten of Helsingfors.[1] Its resemblance to my own is very striking.

A woman was admitted to hospital, aged sixty-nine, previously healthy, except that for fifteen years before she had suffered from a disease of the skin which began in the right nipple, and for which cauterisation had been practised about a year after its commencement. The redness spread slowly to the surrounding skin. When first seen by the author (seven years before admission) the nipple was retracted, and in the skin about the nipple, were many smooth, red, slightly moist, and shiny spots. These were, for the most part, connected with one another, and distributed over the whole of the skin covering the mamma, and in parts beyond it. There was no marked induration of the skin, nor were any enlarged glands to be felt. The appearance was neither that of eczema nor of lupus. The author applied chloride of zinc, fuming nitric acid, and other caustics. The breast soon afterwards became indurated, and was removed. Most of the diseased skin was then taken away, but a few outlying spots were left, because they extended over a considerable area beyond the breast. These outlying spots were treated by caustics. The mammary tumour was found to be typical cancer. The wound healed readily. In spite of repeated cauterisation the affection of the skin spread, and a small nodule of recurrent cancer formed in the scar. The patient's general heath remained good.

Several surgeons expressed the opinion that the skin affection was lupus, so the author tried the effect of an injection of Koch's tuberculine. There was no reaction. Eight years after the breast was amputated, the skin of the whole of the right side of the chest and the upper part of the abdomen was bright red, shiny, and slightly indurated at the margin of the diseased part, which extended across the middle line to the left nipple and for some distance down the arm.

The coloured plate which accompanied the article suggests cuirass cancer rather than what we are accustomed to see in Paget's disease, but the illustrations of histological sections are those of Paget's disease. The author takes the view that the affection is superficial cancer. The case may be taken as an illustration of the fact, that Paget's disease need not necessarily be found in the immediate neighbourhood of the nipple.

Space will not permit of a fuller dissertation upon this most interesting subject. Enough has been said to elucidate its leading features. The rule in practice is clear: That a patch of abiding eczematous irritation about the nipple and areola is a source of danger, especially in elderly women. Where such occurs and proves rebellious to remedies, the existence of epithelioma should be suspected, and when the diagnosis is clear, no time should be lost in advising free extirpation of the skin and mamma.

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[1] *Clinical Sketches* for March 1895.

Lenticular Carcinoma of the Skin over the Breast (" *Cancer en Cuirasse*" *of Velpeau*).—Attention will hereafter be drawn to the occasional occurrence in breast carcinoma, or after removal of the breast for cancer, to the dissemination of the disease over the integument in the shape of disc-shaped nodules. As a still greater rarity, the growth assumes a more diffuse form, yet it is unusual for this to occur without a few nodules being also superadded as white, pigmented, or vascular growths. The skin is hyperæmic, and marked by venules or visible small branching capillaries of a red colour. It is smooth, thickened, stiff, and leather-like, and finally the thorax is set fast in a hard band of disease, which may even seriously affect respiration. The upper extremity is generally greatly swollen. In all the cases I have seen, carcinoma of the breast was the primary affection, and this is true of the vast majority of the cases met with. Certain authors have described cases of this curious disorder when the carcinoma was stated to have commenced primarily in the skin. The thought of the disease beginning in an accessory mamma in such cases naturally suggests itself. Œdema of one upper extremity is a constant and important feature of the disorder, and I have known the sides of the thorax "pit" on firm pressure, which makes me think that lymphatic obstruction has much to do with the appearances.

A most interesting example of "cancer en cuirasse" originating spontaneously is related by Nevins Hyde.[1]

A woman, aged forty-four, had numbness, pain, and slight œdema of the right arm, which became so swollen that puncture had to be resorted to. Coincidently it was noted that numerous small nodules were developing over the skin of the front of the thorax, which became more and more implicated with discoloration, pain, and hectic temperature. Finally, the whole of the skin as far as the waist became transformed into tissue as "dense and inelastic as sole leather," and covered with an erythematous blush. Nodules of cancer were seen here and there, and tongue-shaped invasions of the disease (Languettes) advanced into surrounding territory. There was no glandular affection. The patient died of exhaustion and dyspnœa. The breasts were quite free of growth.

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[1] *American Journ. of Med. Sciences*, March 1892.

The microscopical details are those of spheroidal carcinoma, and in some minor details this case corresponded to one of Besnier's examined by Cornil. Hyde describes a second case, but here the condition of the skin was certainly "secondary" to breast carcinoma.

Mention may here be made of the remarkable wax model in the museum of Guy's Hospital (472). The patient was a shoemaker, aged twenty-five, and the thoracic affection was of two years' duration. The pectoral regions and skin were hardened "like bacon." He had also curious nerve symptoms, with weakness and "twitchings" of the arms. The diagnosis between scleroderma and carcinoma was never quite clear.[1]

Morrow[2] relates a striking case of carcinoma of the skin of the thorax, accompanied by a coloured plate. The affection was, as usual, secondary to mammary carcinoma, and the skin, in addition to being infiltrated, was covered with nodules. "The number and variety of the eruptive elements," writes Morrow, "are the most conspicuous features." We have at the same time an erythematous redness, miliary and pigmented deposits, hard papules, tubercles varied in volume, mostly elevated, nodular masses embedded in the subcutaneous tissues, and, as secondary lesions, broken-down tissues, ulcers, crusts, and cicatrices.

It is indeed evident that much of the diversity of appearances in these rare cases, can be explained by the superaddition of lesions due to scratching and inflammation, upon nodules of growth largely composed of epithelial cellular accumulations.

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[1] See *Guy's Hospital Reports*, 1869-70, p. 305 *et seq.*

[2] *Journal of Cutaneous and Venereal Diseases*, vol. i. 1884.

CHAPTER V

CLASSIFICATION OF TUMOURS OF THE MAMMA — INNOCENT TUMOURS, INCLUDING LIPOMA, ENCHONDROMA, OSTEOMA, ANGIOMA, AND THE FIBRO-GLANDULAR GROUP

Difficulty of classification owing to varied nomenclature—Microscopical difficulties—Types of structure of different tumours—Cystic and other forms of degeneration—Opinions of authorities on the fibro-glandular group of tumours, and on the sarcomata—Classification table—Lipoma, angioma, and other innocent growths—Fibro-glandular tumours—Pure fibroma—Etiology of these growths—Locality—Originating in accessory mamma—Pathology and minute structure—Naked-eye anatomy—"Stalked" fibro-adenomata—Occasional large size of these tumours—Their occurrence in old age—Calcification of—Clinical history of the fibro-glandular group—Question of recurrence—Confusion with sarcoma—Question of spontaneous disappearance—Rarity of true adenoma—Evidence of secretion in some of these tumours—Treatment of the fibro-glandular group of tumours—Abscess after removal—Secondary hæmorrhage after operations for—Thomas's operation—Occasional association with sarcoma and carcinoma—Illustrative cases of previous remarks and statements.

There are few subjects fraught with greater surgical interest and importance, than the pathology of tumours of the mamma. The frequency of carcinoma in this organ, has caused it to be selected for a special inquiry into one of the most important subjects in the whole of medicine, the causation of cancer. It is obvious that in a work especially designed for a concise clinical treatise on maladies of the breast, so intricate a subject as the origin of cancer or of tumours, could not find adequate room for lengthy discussion. The question of causation of cancer of the breast will only, therefore, be alluded to sufficiently to illustrate the subject in its more important bearings, and with the desire to give due acknowledgment and prominence to the labours of those, who have especially worked at this subject.

It may here at once be confessed, that though we seem to be nearing discovery of the primary cause of cancer, we know little or nothing that is indisputable and certain. The matter is still shrouded in obscurity, and all evidences regarding it, culled from the meritorious labours of modern investigators, have been chiefly of a negative nature. The varied nomenclature adopted by different writers, of tumours of the breast, has involved the subject in the greatest confusion. After a long and patient study of pathological writings on mammary tumours, I have reluctantly come to the conclusion that to attempt to combine harmoniously, and to explain, the nomenclature and descriptions of all those who have especially written upon the histological peculiarities and differences of breast tumours, is beyond my power, and would result in confusion worse confounded. Much of the difficulty which surrounds a study of the morbid histology of tumours of the mamma, is due to the varied constituents of the gland blending in various quantities with the different tumours, to coexisting inflammatory change, and especially to the extraordinary differences in structure that may be found in different parts of the same tumour. As an instance of the confusion that occurs in our hospitals regarding the classification of tumours, a statement by Mr. R. Johnson in the *Lancet*, 16th June 1894, may well be quoted. Out of 75 cases treated at University College Hospital and regarded as varieties of adenomata, 9 were not actual tumours at all. Seven were cystic degeneration of the breast. Two were chronic mastitis. One described as cystic sarcoma is doubtful. In the remaining cases, 9 occurred in which "recurrence" was manifest. Some of these were sarcomatous or carcinomatous, as in two or three instances the axillary glands or pectorals were involved. I can conceive nothing more calculated to shake our belief in statistics hitherto compiled from hospital sources generally than such a consideration as this, and I would commend it seriously to the thoughts and criticism of the reader.

To give a sound "microscopical" opinion regarding a breast tumour, it requires that the examiner studies sections from all parts of the growth. The extreme types of innocency and malignancy, fortunately, are as marked in microscopical as in their clinical features. The large class of what are often termed "doubtful" tumours give rise to as many microscopical differences of opinion as is the case clinically. I have been especially struck by the unwillingness of pathologists to give positive opinions regarding tumours of the breast, in the case of important private individuals, when responsible and weighty questions of diagnosis, and especially prognosis, hang upon their verdict. All this makes it clear to my mind, that the distinctions between true tumour formation and hypertrophy, between inflammatory cell proliferation and tumour growth, are, in the mamma, exceedingly ill-defined.

The difficulty and doubt that must surround the microscopical examination of tumours of the mamma are well summed up by Mr. Johnson in a lecture delivered at the College of Surgeons in 1894. "It is well known," writes Mr. Johnson, "that the glandular epithelium of the acini presents widely different microscopic appearances at different ages, and in the various states of rest and activity. These differences are indeed so marked, that caution is very necessary in deciding that a given microscopic appearance of the breast is really pathological, simply from changes in the character of its epithelium. In the next place, chronic inflammatory changes are exceedingly common in the mammary gland, and frequently induce secondary modifications of the glandular elements, whilst their resemblance to certain tumour formations is very close. Moreover, the microscope often fails to make a ready distinction, so that the observer may often be at a loss to decide whether the fibrous tumour of the specimen is the stroma of a tumour, or merely the product of a chronic inflammation; whilst the glandular elements in the preparation may be of new formation, or they may be an integral part of the original gland tissue variously altered by inflammatory changes around them."

With this opinion I cordially agree. The matter could hardly be more clearly or forcibly put. Experience alone will teach requisite caution in forming opinions upon the microscopical details of tumours of the mamma, and the microscope must be looked upon as auxiliary to clinical observation, not as superseding it.

The active mammary gland being largely composed of abundant glandular follicles and ducts, there are few tumours of the breast in young women which are not associated with the presence of adenoid (breast) tissue. Thus have arisen the terms adeno-sarcoma, adenoid cancer, and many more. With all possible respect for the distinguished surgeons who employ these terms in their works and lectures, or in the examination questions for the higher surgical examinations, I cannot think that such terms are either pathologically correct or clinically useful. A tumour should, I venture to assert, be named from the preponderance of tissue it contains, or from the presence of some structural arrangement of striking clinical importance, especially evidence of sarcoma or cancer.

In saying this, I am very conscious of the danger of being accused of dogmatism for the sake of aiming at simplicity. It is, however, very needful in a clinical work, to attempt to put before the reader those points of morbid histology, which are really useful to him and reliable in practice, in as plain and straightforward manner as possible. Any system of nomenclature, which would do away with calling the same thing by different names must tend to clear confusion. Before attempting to draw up any systematic classification, I would remind the reader of the leading histological features of carcinoma, sarcoma, adenoma, and fibroma respectively. It is upon a clear conception of these, and an accurate observation of what may be termed histological rules, that a microscopical examination of any value can alone be made.

(1) *Carcinoma* probably originates in epithelial proliferation. An alveolar stroma is usually to be made out, but this is often really due to the transverse section of ducts and acini. The cells lie in contact, and are arranged in clusters (acinous carcinoma), or elongated columns separated by fibrous tissue, and are of the epithelial type. In the mamma the epithelial change is said to begin in the ducts or acini. I am more and more inclined to believe, that the earlier changes are found in the ducts, and that more cancers of the breast are of

the "duct variety" in their earlier stages than is generally believed.

The direction in which the section happens to pass through the ducts, crowded with cells, will make varied appearances which must be taken into account.

(2) *Sarcoma* has its commencement in connective tissue proliferation. The cells, of an embryonic type, are separated by intercellular substance, or a fine fibrillar matrix; they may form the walls of the blood-channels, and often project into them. The alveolar sarcoma of Billroth is rare, and most growths thus described are really carcinomata. The presence of intercellular substance is all-important in distinguishing between these forms of growth.

(3) *Adenoma* resembles in its structure the gland tissue of the organ in which it originates. The imitation is fairly complete. Whatever free epithelial proliferation and formation may exist, the epithelium never invades the adjacent connective tissue as a small-celled infective growth. The tumour is invariably encapsuled, but may be connected with the mammary substance by a kind of stalk: cysts and dilated ducts are commonly found in the adenomata of the mamma.

(4) *Fibroma* is composed of fibrous tissue in a well-developed condition. The inclusion of glandular tissue in the growth, though usual, is quite a minor phenomenon. A fibroma during its developmental stage, when the cells are yet young, is most difficult to distinguish from a sarcoma.

It cannot be too prominently brought before the mind of the reader, that epithelial proliferation transgressing its normal limits, and straying into the connective tissue, means cancerous change, and it is upon this one important point that the diagnosis of a "doubtful" tumour composed of glandular tissue often rests. Many parts of a cancer consist of glandular tissue, but it is the heterology of this tissue, with its riotous proliferation, which is the chief sign of cancerous action.

The multiplicity of ducts in the breast, leads to the consideration, that cysts from obstruction may occur in connection with any tumours. Degenerations are, of course, common.

Thus in cancer are found hæmorrhages, sanguineous cysts, colloid, or probably more accurately, mucoid change, and very rarely calcareous degeneration.

Sarcoma may be the seat of hæmorrhages, blood-cysts, or mucoid changes.

Adenoma or fibroma is more rarely extensively altered by secondary processes, but cysts are exceptionally common from the inclusion of clusters of secretory cells, or through duct obstruction.

The rarer forms of tumours, as lipoma, enchondroma, angioma, demand separate discussion, and I think it is at least doubtful whether myxoma ever occurs in the breast as a primary growth. Are not such tumours really myxomatous degenerations of fibro-adenoma or sarcoma? Such degeneration of both these tumours is quite common.

It has been stated by authors of repute, that sarcoma contains few, if any, lymphatics, whereas it is well known that carcinoma is in free communication with these channels. Sarcoma is propagated by the vessels, carcinoma by the lymphatics. This rule, like many other generalisations in medicine, is not absolutely true, and instances of sarcoma affecting glands secondarily are not wanting, and will be presently quoted.

It may be observed that in this work no rigorous classification of the sub-varieties of sarcoma is made, or of the times of life they appear. Increasing personal experience of the examination of mammary tumours, only makes me painfully aware of the limitations of our knowledge, and I have been quite unable to separate the groups of rapidly growing tumours containing indefinite tissue, with the certainty of many authors.

Gross, in his treatise on tumours of the breast, a work which must be quoted with the weight its authority deserves, takes the following views:—True adenoma is among the rarest of neoplasms which have their origin in the connective tissue. The inclusion of gland structure is accidental. The classification adopted by this author is according to the origin of the growths from connective tissue, or epithelial elements, and the type of development they attain to. He works along the old and safe lines that tumours, however originating, if they are of an embryonic type, are malignant. He speaks strongly against the term adenoma, and points out that a tumour composed of hyperplasia of glandular tissue is so rare "that true adenomata must be classed among the most infrequent of neoplasms."

Bryant, however, in a fair criticism of the views of Gross, prefers to retain the word adenoma. This author largely adopts and quotes the opinions of Creighton. The higher and more complete the functions of the breast, the more activity that is displayed in secretory action, the more the tumour will approach to the benign type. Thus in young women, in whom developmental force is active, such tumours as adenoma, fibroma, are found. In old women, when the functions of the breast are in abeyance or retrograding, the tumours are always of a degenerate type, in fact, carcinoma. These opinions are sound and of great clinical value.

Johnson, in his lectures at the College of Surgeons in 1894, takes an exactly opposite view to Gross. He regards true fibroma as excessively rare, and adenoma as common. He well points out that adenoma may be firm and hard, or soft and succulent, according to the amount of fibrous tissue it contains.

In speaking of the glandular type of tumours, I shall hope to show how rare either pure fibroma, or pure adenoma is in my own experience, and how the mixed tumours are far the more common.

With regard to the very early origin of carcinoma, one school, of which Virchow, Wilks and Moxon may be taken as advocates, hold that the growth originates in proliferation of epithelial cells, which subsequently break through the acini and invade the lymphatics.

Other observers, of whom Creighton and Thin may be taken as types, maintain the doctrine of epithelial infection. That is to say, that the cells of the connective tissue proliferate when brought into contact with the infective proliferating epithelial cells. Other observers of this class affirm that an infection may actually take place of the cells outside the ducts, without any actual migration taking place of epithelial cells. Observers like Rindfleisch speak positively upon the transit of epithelial cells from the acini, wandering into the connective tissue lymph paths, and causing infective proliferation.

Billroth and his followers are very certain that epithelial cells originate from epithelial cells alone, and that connective tissue originates from connective tissue, and from a developmental point of view this argument has much to favour it.

The views of Creighton as to the development of the mamma have already been noticed in the first chapter. Following up his theory of development, this author most ingeniously argues, that tumours of the breast originate in a spurious imitation of the natural processes, in physiological errors associated with waste cellular products derived from the epithelium of the acini. These cells infiltrate the connective tissue, instead of passing off by the lymph paths. According to the stage of development they represent, so does an embryonic or more structural growth ensue.

It will be observed that this theory militates against the idea that sarcoma always originates from connective tissue, and hence, many refuse to adopt it. Thus it is seen that the main difficulty over which histologists dispute, is the real origin of the small-celled growth seen outside the acini in early carcinoma. Is it epithelial? Or, on the other hand, is it due to proliferation of connective tissue corpuscles from an infective element? There is one undoubted and remarkable clinical fact which tends very strongly to support Creighton's observations. Growths which approximate to a high degree of development, as fibroma, or pure adenoma, are almost universally found in young women in whom the physiological processes are active. On the other hand, growths, which show no tendency towards development into any fixed tissue, as the carcinomata, are generally found in elderly women, in whom degenerative mammary changes are marked.

Gross, after tabulating and arranging 777 cases, comes to the conclusion that "structural perfection of the mamma renders it most obnoxious to fibroma, sarcoma, and adenoma, while atrophy or decay predisposes it to myxoma and carcinoma."

The classification of tumours I now propose to present to the reader is open to the criticism of undue simplicity. I cannot but believe, however, that it will be found correspondingly useful for clinical purposes. It is possible, by dividing and subdividing microscopical appearances, to make the most complicated classifications possible.

TUMOURS OF THE MAMMARY GLAND

Benign tumours which imitate in their tissue normal structures.	Lipoma Enchondroma Osteoma Angioma	Very rare.
	Fibro-adenoma	Common.
	Pure fibroma Pure adenoma	Rare.
Malignant tumours having their origin in connective tissue.	The varieties of sarcoma.	
Malignant tumours having their origin in glandular epithelium and the epithelium of ducts.	The carcinomata.	

The varieties of cysts originating, apart from tumours, will receive a separate consideration.

This exceedingly simple classification is clinically useful, and for that reason I have especially adopted it. Practically, what every surgeon, and every patient wishes to know, is whether a tumour in the breast is likely to return after removal or not; in other words, whether it is innocent or malignant. Precisely the same rules apply here as are to be relied upon in all parts of the body. Embryonic growths, showing no tendency towards higher development, are likely to recur, and a rapidly growing sarcoma with anomalous cells will probably be more rapidly destructive to life than carcinoma. On the other hand, the fibroma of the breast with concentric whorls, or parallel bands of well-formed fibrous tissue, combined with scanty glandular structures, is an innocent growth, and when removed does not return.

Great confusion has also been introduced into the pathology of breast tumours, by the nomenclature of the various growths within the ducts. It cannot be too clearly understood that cases often described as "duct-papilloma" may legitimately come under the class of adenoma or carcinoma, according to the type the epithelium presents, and its invasion of surrounding structures or its strict limitation to the interior of the cyst wall. The numerous degenerations too of mammary tumours have given needless names, and originated numerous sub-varieties. For instance, a sarcoma may be largely converted into jelly-like material. It may have large cysts full of sanguineous or glairy fluid, and these cysts may have secondary growths on their walls. Nay more, large areas of cartilage may be found. Notwithstanding all this, the tumour is primarily a sarcoma. This is its significance, its clinical importance, and by this name it should be known. However much the characters of any tumour are altered or annulled by secondary degenerative processes, the detection of the primary structure of the growth, must assign to it its correct nomenclature, and what is more important, its correct clinical importance as to risk of recurrence, or subsequent fatality.

It will here be convenient to discuss those neoplasms of the mamma composed of fat, cartilage, bone or vascular tissue, and it may be at once pointed out that these formations are of considerable rarity, and therefore of comparatively small clinical importance.

Careful distinction must be drawn between such conditions and degenerations of other tumours. For instance, cartilage may be mixed with sarcoma, chondrifying sarcoma, and such a tumour will be looked upon as a variety of sarcoma rather than as a cartilaginous growth. The same remark applies to osteoid tumours. These rare formations are usually calcified fibro-adenomata, calcified carcinoma, calcified sarcoma, or calcareous cysts.

Lipoma.—Fatty tumours of the mammary gland itself are among the rarities of pathology. Lipomata in the cellular tissue in the immediate vicinity of the mammary gland are not unknown, and are often wrongly termed lipomata of the breast. Lipomata have been removed from the neighbourhood of the mamma in early life. They are then often mixed with nævoid tissue, and have a bluish tinge. The situation of this well-known growth (nævoid lipoma) is generally in the cellular tissue, and when it occurs over the mamma, the diagnosis and treatment present nothing peculiar. In cases of great hypertrophy, a considerable quantity of fatty tissue is mingled with the connective tissue, but this can hardly be termed true fatty tumour growth. Again, it is well known that, in certain women about the menopause, the breasts become converted into enormous masses of fatty tissue, but this is an infiltration, and in no way a true tumour formation. Diffuse lipoma may occasionally affect the pectoral regions, and in Baker's article there is an excellent illustration of a man who had in each pectoral region a mass "as big as a full-sized female breast, with the nipple in its centre." In this case, other diffuse fatty growths were found in the scrotum, on the abdomen, over the mastoids, and elsewhere.[1]

In St. Bartholomew's Hospital Museum is a fatty tumour which lay in connection with a thin-walled cyst in the mamma of a lady aged fifty-five. She had noticed a tumour in her left breast for about six months.[2]

There is a preparation in the Guy's Museum to show a large fatty tumour of the mamma containing a piece of bone. It was removed post-mortem from a woman of eighty-seven, who had borne it for fifty-five years. It was thought to be an "adenocele." She had shown it to A. Cooper "on the day Lord Nelson was buried."[3] Sir A. Cooper also excised a fatty tumour of the mamma weighing 14 lb., and a similar case is related by Brodie in his clinical lectures.

A case of lipoma mammæ was operated upon by Riedel of Jena. It is related by Haeckel.[4] The tumour was subcutaneous and occupied the lower and external region of the right breast in a single woman of forty. Externally, the clinical features were those of a lipoma, but microscopically mammary tissue was found in the centre of the lipoma, and hence it was supposed that a lobule of gland tissue had become surrounded by fat.

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[1] *Med.-Chir. Trans.* 1886, vol. lxix. p. 41.

[2] 3160(a) St. Bartholomew's Hospital Museum.

[3] 2300^{50} Old Catalogue, Guy's Museum.

[4] *Semaine Médicale*, 1894, vol. iv. p. 435.

Velpeau relates two cases of fatty tumour of the breast with great distinctness. In both of them, however, the subcutaneous tissue was principally involved. He refers to the ease with which a subcutaneous fatty tumour may be confounded with a cyst. In one of his cases this mistake actually occurred, a trocar and cannula being passed into the supposed cystic cavity. Nothing came out, and the operator pushed a stylet to the bottom of the supposed cyst, and turned it "from side to side in all directions." Still nothing escaped. "I thought," writes Velpeau, "there might be a sebaceous or hæmatic cyst, and at once proceeded to a more complete operation. The skin was divided over the whole extent of the tumour, which was soon exposed, and then exhibited all the characters of a fatty mass, simple, soft, and composed of three principal lumps which were extirpated."

A stout cook, aged fifty-two, was admitted into St. George's Hospital in 9th October 1878, under Mr. Pollock's care. She had noticed a swelling in "front of the right shoulder," with aching pain, for about two years. Just above, and to the outer side of the left mamma was a soft, rounded tumour, about 4½ inches in diameter. The skin "dimpled" over it in a characteristic way. The tumour was removed and proved to be fatty. There was no implication of the breast-tissue proper. Only five cases of lipoma of the mammary region were treated at St. George's Hospital as in-patients in a period of thirty-five years. All of these were really para-mammary.

In October 1893 I witnessed my senior colleague, Mr. Jacobson, remove a fatty tumour from the mammary region of a woman aged fifty-five at the Royal Hospital for children and women in the Waterloo Bridge Road. The patient was a stout woman, and had noticed a swelling of the "right breast" for about six weeks. The tumour is described by Mr. Young, then house-surgeon, as being about the size of a turkey's egg, and situated over the centre of the right pectoral, smooth, semi-fluctuating, with the skin unimplicated. There were no axillary glands. Another swelling, obviously a lipoma, existed over the left ilium. A free incision allowed a lobulated, fatty tumour to escape. It was in contact with the upper part of the breast, but not incorporated with it, and lay apparently beneath the fascia, but its true nature before removal was very dubious.

A woman, aged thirty-six, was admitted under Mr. Brodhurst's care into St. George's Hospital in May 1865. There was a soft, lobulated swelling on the left side just below the breast, freely movable under the skin, which was puckered. The tumour was removed and proved to be fatty. It apparently was free of the breast-tissue itself.

A single woman, aged thirty-six, was admitted into St. George's Hospital on 3rd May 1865. Six months ago she noticed a tumour in the left breast. The tumour was noted to be immediately below the breast, not in it, and was removed in the ordinary way, the wound soon healing. It had all the ordinary characters of a fatty tumour, as lobulation and adhesion to the skin.

Moore[1] describes a peculiar case, where a lipoma was discovered in a cavity in the centre of a myxo-sarcomatous tumour, removed by Porter. On perusing this case, I am inclined to believe that the so-called lipoma, was really a portion of the original tumour which had undergone fatty degeneration.

If the breast be amputated in the case of para-mammary lipoma, the surgeon may find to his chagrin that the tumour is quite free of the breast-tissue. An instance of this will be quoted in the Appendix on affections of the male breast (p. 491).

An almost exactly similar case is related by Brodie of a doubtful tumour of the breast in the wife of a medical man. On exploratory incision, a large lipoma was found behind the breast, which it lifted up.[2] The tumour was quite separate from the mamma itself. Billroth had to deal with an enormous enlargement of the right breast, which hung down to the pelvis. Unfortunately, the case was taken to be hypertrophy, and the whole breast was amputated. A huge, retromammary lipoma was then found, and the breast remained flattened over it, but apparently was healthy. The importance of such cases from the point of view of operation is very great, and in the remarks upon hypertrophy of the mamma, it is mentioned how a unilateral affection of this kind, should make one suspect tumour rather than hypertrophy.

Large Fatty Tumour of Breast of Twenty-three Years' Growth.—A married woman, aged sixty-four, was admitted into St. George's Hospital under my care on 22nd June 1896. She has noticed the swelling for over twenty years. It started, she declares, in the axilla, and was about the size of a walnut. It has since grown forwards and inwards, and apparently displaced the breast. Forty years ago she had three small abscesses in the axilla, and they were opened at a hospital. The patient has always had good health, and the tumour has only inconvenienced her from its ever-increasing bulk. She has had a numerous family, and has used the breast on the affected side for suckling. She has never had any abnormal discharges from the nipple. The left axilla and whole mammary region are occupied by a large, somewhat lobulated and pendulous tumour, the size of a cocoa-nut. On careful examination the small and atrophic breast seems to ride upon the surface of the tumour, and to be pushed over to near the mid-sternal line. The tumour is lobulated, soft and elastic, but here and there masses are to be felt of a harder consistency. The skin is not adherent, but marked by large varicose veins, the nipple is quite free. There is no distinct fluctua-

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[1] Vol. lxiii. of the *Dublin Journal of Medical Science*, 1877, p. 489.

[2] *Lectures on Surgery*, 1846, p. 271.

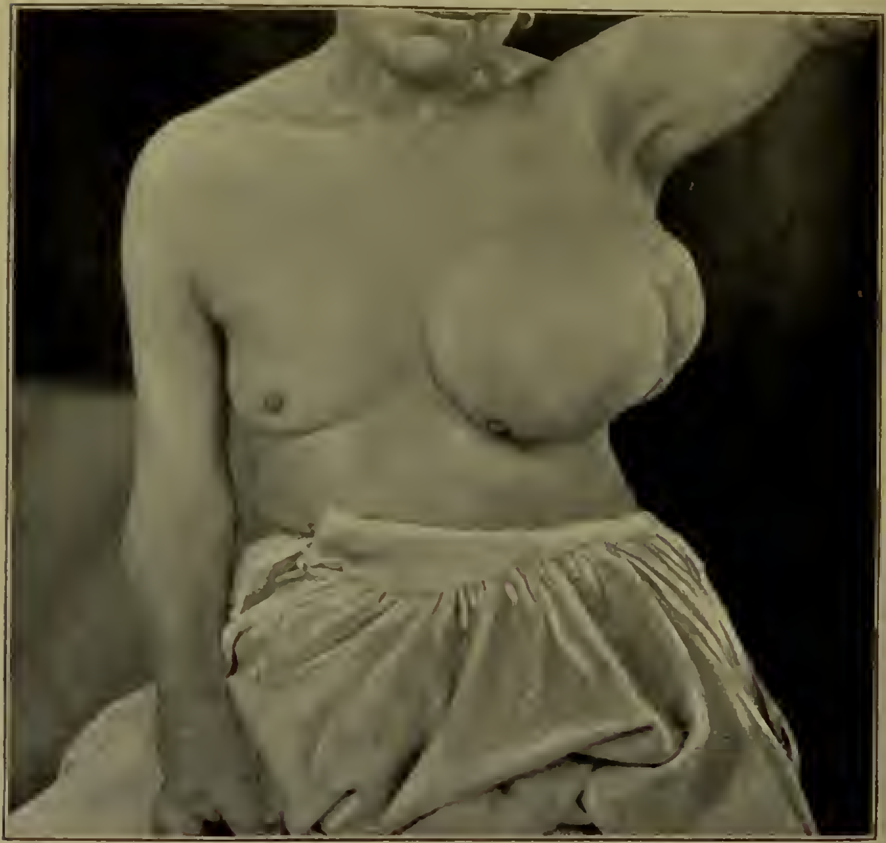

Fig. 23.—Para-mammary lipoma of large size.

tion anywhere. The similarity to general hypertrophy was very close. On cutting into the tumour, it was at once perceived that it consisted of fat, and it was readily removed after making extensive and appropriate incisions through the capsule. Irregular, numerous fatty prolongations infiltrated the fibrous stroma of the mamma. Externally, the tumour reached nearly to the axillary apex, and behind to the venter of the scapula. A huge chasm was left after its removal. The mamma with the nipple was preserved. The patient made a rapid recovery, and the breast with the nipple became quite symmetrical. The mass, after drainage of blood and serum, weighed 3½ lb.

In modern times such growths are seldom permitted to attain to a large size, and we have to go back many years for instances of enormous tumour formations. One of the most extraordinary accounts of huge fibro-fatty tumours of the mammary region I have been able to meet with in literature, is related in the *Lancet*, with an accompanying diagram.

A nobleman of Verona in the year 1796 perceived a small, movable tumour beneath the left clavicle in the spot where he had been shortly before wounded by a French officer. This tumour progressively increased in size until it attained to a huge size, and no one would attempt its removal. In June 1823 the tumour, which had existed for twenty-seven years, had reached an enormous bulk, well shown in the *Lancet* engraving. It hung down from the left mammary region nearly to the patient's thighs. Signor Portalupi alone advised its extirpation, and in the teeth of some surgical opposition from the authorities of the period, he removed this enormous tumour in the short space of eight minutes. There was little hæmorrhage, and no difficulty in the operation, and the unfortunate nobleman soon recovered his health and strength. The mass after removal weighed 52 "medical pounds."[1]

A tumour removed by Guthrie, which was of great size and covered the chest from the fourth rib to the clavicle, appears to have been of a fatty or fibro-fatty nature. It grew in a woman, aged forty-five, and was twenty-two years in formation.

The only case of congenital lipoma I am aware of in this region, is figured by Ashby and Wright in their work on Diseases of Children. The tumour was a myxo-lipoma, and judging from the illustration it was of large size.

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[1] *Lancet*, vol. iii. 1824, p. 24.

The history of these and similar cases tells its own tale, and indicates the appropriate treatment.

(1) Diffuse lipoma may affect the tissues of the mammary gland.

(2) Ordinary lipomata may grow in the subcutaneous tissue round the breast or in the retro-mammary tissue. Such tumours may displace the mammary tissue if of large size, and are apt to be confounded with cysts or simple hypertrophy.

(3) Extirpation is readily carried out, and is the appropriate treatment. The breast-tissue itself seldom if ever needs removal. After removal of the tumour the gland with the nipple can be replaced.

Angioma.—In the chapter on affections of the skin of the mamma and the nipple, it has been pointed out that nævus may attack these parts and extend to the mammary tissue beneath. True cavernous tumour implicating the breast substance is very exceptional. I have never encountered a case where the skin was not principally affected. Bryant, in his work on Diseases of the Breast, refers to a case where the whole gland was converted into a nævoid mass, which could be easily reduced by pressure. No treatment was adopted.

My colleague, Mr. Pick, has told me of a case of nævoid growth of the mamma in a young child. It grew so rapidly that it actually doubled its size in four days. The base was constricted with a subcutaneous ligature, and setons, steeped in perchloride of iron solution, were passed through the growth, which inflamed and consolidated, a cure ultimately resulting. This method of treatment is worthy of recollection, though it must be associated with a little risk.

A good instance of nævoid growth, or erectile tumour, of the male breast is related by Sutton.[1] The patient was a lad aged seventeen, and a small nævus had been noticed above the right nipple at birth. Ten years ago the breast enlarged and became painful, and the swelling slowly increased in size. The tumour is described as discoidal in shape, measuring 3½ inches in its greatest diameter, adherent to the skin, and presenting a purplish tint. Near the nipple a small spot of ulceration existed, from which the blood oozed in a small but continuous stream. It was treated by excision. Care was taken to keep wide of the growth. Each vessel was ligated as divided, and nearly sixty ligatures were required. The case did well.

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[1] *Clinical Society's Trans.* vol. xxii.

The most remarkable case ever related in this country of angioma of the mamma, was treated by Image of Bury St. Edmunds in 1845.[1]

The patient was a girl, aged twenty-one, a native of Brandon. The history was uncertain, but she had noticed a red mark on the left breast for about ten years. From this time the breast continued to enlarge. The mamma is described as of large size, of a blue or slate colour, and by gradual pressure it could be reduced to at least one half its bulk, the patient complaining then of a sense of fulness in the head, with faintings when the pressure was withdrawn. Some idea of the size of this tumour may be gathered from the statements that it measured 15 inches round at its base, and horizontally 11 inches. Removal was attempted, by strangulating the vessels at the base with ligatures, having turned back two flaps on either side. This proceeding was, however, associated with such loss of blood, that the patient died the same evening. The description of the structure of the tumour is too lengthy to here reproduce, it was obviously what we should now term a cavernous nævus. The coloured plate is well worth inspecting, and the various methods of treatment suggested by the "authorities in London" give us an excellent example of the practice of surgeons in these dangerous cases in 1845.

Velpeau does not markedly allude to angiomatous tumours of the breast, and Gross, in his elaborate work, gives them no mention.

Virchow refers these tumours, to the class of myomata of the unstriped muscular tissue of the areola and nipple with telangiectasis, and Langenbeck speaks of a case where the arteries and veins were so dilated that the mass resembled a vascular goitre.

The main interest of these rare maladies is the care with which their treatment should be carried out. Should excision be contemplated, the cavernous mass must be kept wide of, and on no account cut into. Ligatures may be applied round the base of the growth, or portions of it may be subcutaneously strangulated. Should a surgeon meet with one of these formidable cases, he would have to carefully consider it in all its aspects before attempting any treatment. I should be inclined to generally advise excision, keeping quite away from the growth, and having an able assistant to rapidly apply pressure forceps to the vessels as they are divided. Any cutting operation which would involve the tumour itself, would be associated with the gravest risk. The application of perchloride of iron in these cases must always be hazardous, unless, as in Mr. Pick's case, the surgeon can satisfy himself that the mass is completely isolated from the general circulation, by a constricting ligature.

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[1] *Med.-Chir. Trans.* vol. xxx.

Osteoma and Enchondroma.—It is extremely doubtful if these growths ever occur primarily in the mamma. In all the cases I have perused, the presence of bone or calcareous material has been accompanied by other tumour formation. Cartilaginous tumours have been found in connection with sarcomata, under which heading they will receive mention. "Osteoid tumours," write Jamain and Terrier, "are extremely rare." These authors quote cases by A. Cooper, Bérard, Heurtaux, three of Stilling, and one of Reclus. In the case of Heurtaux removal was followed by axillary recurrence and general dissemination, with death eleven months after. In Stilling's cases one of the patients died of lung deposits, the growth having propagated itself through the veins. The true nature of these growths is thus shown; they were sarcomata or carcinomata undergoing calcareous change. In the others the operation was incomplete. In the case of Reclus the tumour is said to have been a fibro-adenoma, showing in some places myeloid cells, in others osteoid tissue.

A specimen of undoubted enchondroma of the breast was shown by Stefanini at a meeting of the Società Medico-Chirurgica of Pavia on 14th July 1888. The tumour, the size of a small hen's egg, had existed painlessly for twenty-five years in the breast of a woman of fifty. Stefanini alluded to five other cases by Astley Cooper, Nélaton, Velpeau, Cruveilhier, and Leser.[1]

It is pretty obvious on perusal of the above cases, that perhaps with the exception of bony formations in fibrous or fatty tumours, all such growths in the breast will be found to be really cartilaginous or calcareous degeneration of sarcomatous or carcinomatous growths. They are analogous to the calcifying tumours of the bones or testes.

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[1] *Brit. Med. Journ.* 15th September 1888.

The following case will illustrate my belief that sarcomatous growth will usually be found in connection with enchondroma of the mamma:—

A case is reported in which the diagnosis was made of cystic enchondroma of the mammary gland.[1]

The patient, a woman of thirty-three, noticed at the age of twenty-three a hard nodule in the external upper portion of the right mamma. The following year, during her first pregnancy, it grew to the size of a goose's egg. Up to 1894 it remained stationary. She was then confined for the fourth time. After this it rapidly increased; but there never was any pain. The gland was three times larger than the other. The tumour appeared to be made up of several nodules, some of the size of a pigeon's egg. The superficial veins were dilated, and the nipple obliterated. The skin was movable. There was a distinct division between the tumour and the normal tissue. The axillary glands could not be palpated.

On section a large hollow was found in the middle of the tumour, which consisted of two larger and one smaller cavities; a hæmorrhagic, mucous fluid escaped. The thickness of the wall was about 1½ to 2 cm. Macroscopically this seemed to be hyaline cartilage.

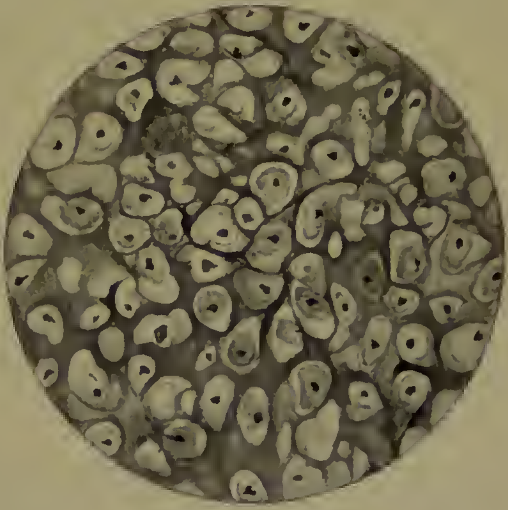

Fig. 24.—Enchondroma from a tumour of the mamma of an old bitch.

Microscopic examination revealed islands of hyaline cartilage, which were divided by numerous connective-tissue septa. In the last a large number of vessels could be seen. In numerous spots of hyaline cartilage retrogressive metamorphosis was observed, which gave rise to mucous degeneration and development of cysts. An area of sarcomatous tissue was also found. This was on the lower pole of the tumour, and was probably due to an especially energetic proliferation of the connective-tissue cells, thus causing this secondary small sarcoma.

Pure enchondromata are found in the mammary gland of old animals. There is a specimen of a tumour, containing bone and cartilage, from the mammary gland of a bitch in the museum of St. Bartholomew's Hospital, and I saw a similar specimen at St. George's in 1897. In some parts of this tumour sarcomatous change was found, and secondary nodules occurred in the animal in the adjacent cellular tissue. This was, therefore, as usual a mixed tumour.

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[1] Happel, *Beiträge zur klin. Chir.* xiv. 1895, p. 721; *American Medico-Surgical Bulletin*, 18th April 1896.

Fibro-glandular Tumours of Mamma.—The true statistical frequency of the fibro-glandular group of tumours, as compared with other mammary neoplasms, is difficult to estimate from published writings or hospital reports. What one author terms "adenoma" another calls "fibro-adenoma," and a third rejects the term "fibroma" entirely. Under the term "chronic mammary tumour" in hospital reports a large number of neoplasms are grouped together; some fibromatous, some adenomatous, the greater number mixed, while sarcomata and inflammatory formations are doubtless also sometimes thus designated, the true nature being only ascertained after removal and microscopical examination. Easy as it would be to present tables from my own experience and that of the numerous authors on mammary disease, I doubt that these would be useful, and all that I can certainly state regarding the fibrous and glandular group of tumours in the breast is as follows:—

They generally occur in young women; they are firm in texture, slow in growth, and encapsuled; they are usually benign and not recurrent, and they are prone to undergo cystic changes.

As regards the age at which these tumours occur, we have perhaps more definite information. They are essentially affections of girls and young women, though on reading this chapter instances will be given of these tumours occurring in elderly women. Cases of fibro-adenomata at the ages of thirteen and twelve are related by Pattison. The excellent plates leave no doubt of the nature of the tumours.[1] The youngest case I have been able to find at St. George's Hospital in a period of thirty-five years was fourteen years of age, the oldest was fifty-six. Bryant has related a true fibro-adenoma occurring in the breast of a woman aged seventy-one. This is the oldest case with which I am acquainted.[2] The same author relates a case in a child of only ten months old. The tumour was removed by Mr. Cooper Foster. It is noteworthy that the specimen contained fat, which is very unusual in such tumours.

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[1] *Journ. of Anat. and Physiol.* 1891-92, p. 509.

[2] *Path. Soc. Trans.* xvii. p. 283.

The following tables illustrate the fact that tumours of the fibro-glandular group occur in comparatively early life. Owing to the varied classification of authors the cases cannot be added together and considered as a whole:—

GROSS.—Eighteen examples of pure adenoma collected from various sources.

2 appeared between 10 and 20 years of age.
4 " " 20 " 30 " "
6 " " 30 " 40 " "
5 " " 40 " 50 " "
1 " " 50 " 60 " "
—
18

Twelve cases appeared before the fortieth year, six after that age.

BRYANT.—One hundred cases of tumours presumably adenomatous, fibrous, or mixed (fibro-adenoma).

27 appeared between puberty and 20 years of age.
35 " " 21 " 30 " "
22 " " 31 " 40 " "
13 " " 41 " 50 " "
3 " " 50 " and over.
—
100

Eighty-four occurred before the fortieth year, sixteen after.

A summary of fifty-two cases of "adenoma" is given in the Middlesex Hospital Reports for 1889, and the ages are as follows:—

Between 15 and 30 are 28 cases.
" 30 " 40 " 14 "
" 40 " 50 " 7 "
Over 50 " 3 "
—
52

Out of seventy-four cases occurring at this hospital between 1875 and 1894, three occurred in males.

Gross.—Fibroma. (Probably the fibro-adenoma of English authors.) Fifty cases.

11 appeared between 10 and 20 years of age.
18 ,, ,, 20 ,, 30 ,, ,,
11 ,, ,, 30 ,, 40 ,, ,,
7 ,, ,, 40 ,, 50 ,, ,,
3 ,, ,, 50 ,, 60 ,, ,,
—
50

Forty occurred before the fortieth year, ten after.

Birkett.—One hundred and twenty-five cases.

90 appeared between 10 and 30 years of age.
35 ,, ,, 30 ,, 50 ,, ,,
—
125

The majority occur before the age of forty.

Cases classified as fibro-adenomata, chronic mammary tumour, cystic adenoma, etc., admitted into University College Hospital between 1877 and 1890, a period of thirteen years.

Between the ages of 15 and 30 there were admitted 31 cases.
,, ,, 30 ,, 40 ,, ,, 14 ,,
,, ,, 40 ,, 50 ,, ,, 15 ,,
,, ,, 50 ,, 60 ,, ,, 1 ,,
—
Total 61

Two cases were noted in males.

In thirty years 130 examples of tumours of this kind were treated in St. George's Hospital. Numbers of such cases are of course attended as out-patients, and these figures give no true idea of the actual number which occur. Of these 130 I have selected 63 where the diagnosis of the hard, chronic, fibro-glandular tumour seemed undoubted, and the ages were as follows:—

Before 20	14
Between 20 and 30	31
,, 30 ,, 40	8
Over 40	10
	63

Forty-five occurred before forty, eighteen after.

Twenty-one were married, forty-two were single. In two cases where the patients were forty-two and fifty-six years of age respectively, the whole breast was removed owing to the extreme hardness of the growths and their strong resemblance to scirrhous cancer.

I have thought it better to include under one heading that large and important class of tumours which are characterised histologically by a resemblance to normal structures, fibrous or adenoid (glandular) breast tissue, and clinically by benignancy and occurrence during the periods of life when the breast is functionally active. Clinically speaking, all such tumours fall into one group. At the one extreme of the list we have the hard fibroma; at the other, the more soft and succulent adenoma composed in bulk of well-formed glandular acini. But between these two extreme types are a large number of tumours which are common, which contain fibrous and connective tissue mixed with glandular material in varying proportions. So widely does the structure of these tumours vary even in different parts of the same growth, that equally competent observers may easily differ as to whether they should be included under the head of fibromata on the one hand, or adenomata on the other. It would be easy to describe many varieties of such growths, but this would serve little useful purpose. Having constantly examined specimens of these tumours over a period of eight years, I have seldom seen a pure adenoma or a genuine fibroma of the mamma. That this may be the result of comparative want of experience, I am ready to allow. Yet it sufficiently indicates to the practitioner what he requires to know, that the common innocent tumour of the breast in young women is composed of both fibrous and glandular elements mixed in varied proportions, and hence the term fibro-adenoma is most applicable to it.

One of the few examples of apparently pure fibroma of the breast, which occurred during thirty years at St. George's Hospital, is as follows:—

A married woman, aged forty-two, was admitted into St. George's Hospital on 9th July 1883. The right mamma contained a large lobulated irregular tumour, very hard and heavy. The nipple, skin, and axillary glands were free. So hard was the tumour, that notwithstanding its mobility, excision of the whole breast was practised. On section, the growth presented many of the characters of hard carcinoma. On microscopical examination, however, the tumour proved to be a pure fibroma, with concentric whorls of fibrous tissue. There were no glandular elements in the sections inspected.

The fibromata and adenomata in the breast may, from a histological point of view, be kept separate, clinically it is quite impossible to do so. Accordingly in this chapter, only the typical varieties of this group of tumours will be described, the writer trusting that the types dealt with are sufficient to illustrate the subject from a pathological and clinical standpoint. I have seen several examples of this disease in animals, and in vol. xl. of the *Pathological Society's Transactions*, growths of the fibro-glandular type are described in the udder of a cow and the breast of an old rat.

Etiology.—Some of these tumours are said to be due to a slight blow,[1] and many occur in unmarried girls, when they are generally attributed to some spurious excitation of cellular elements from sexual causes. The proper development of such activity in pregnancy and lactation being not affected, a morbid growth resembling gland tissue is the result.

Were this true, we might suppose that such growths would be far more common than they really are. Another view, that of Cohnheim, strongly supported by Mr. R. Williams, is to the effect that these tumours really consist of mammary "sequestrations," the little masses of embryonic tissue taking on active growth. The fact that many of these tumours are connected with the surrounding mammary tissue by a kind of stalk is rather in favour of this opinion.

Adenomata of Cystic Origin.—Attention must be drawn to the fact, that certain tumours composed of purely gland tissue have their origin in the excessive and luxuriant growth of the papillary projections of duct papilloma. These tumours to the naked eye are soft and friable. They are lobulated and foliaceous, like the "heart" of expanding cabbages. The microscopical sections are so soft, that they easily break up and fall to pieces in solutions. The tumours are ultimately found to be composed of a multitude of papillary dendritic processes, coalescing and combining in all possible ways. The glandular epithelium is peculiarly large, of a columnar shape, and situated upon a central stalk with a fine vessel running along it. Hæmorrhages are common in such growths, and the distinction from duct carcinoma is by no means clear or easy. It is to these tumours, which are after all rare, that the term pure adenoma is often applied.

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[1] "Nous avons observé une tumeur bénigne du sein, chez une dame, dont le sein avait été plusieurs fois contus par la crosse du fusil dans une partie de chasse" (Terrier, *Manuel de pathologie et de clinique chirurgicales*, tome quatrième, 1889, 1892).

Excellent examples of adenomata having arisen in the excessive growth and proliferations of the vegetations of duct papilloma are given by Pollard.[1] In the same article this author describes a case where, in addition to a bloody discharge from the nipple, a soft warty growth the size of a pea projected. This was repeatedly destroyed by ligature and caustics, until a hard tumour formed beneath the nipple and the breast was excised. This is clearly an instance of duct papilloma becoming cancerous (duct cancer).

Locality.—While it is true that fibro-adenomata may originate in any part of the breast, a considerable number will be found to be marginally situated, as towards the upper aspect, the sternal, or axillary side. It is tempting to assume that some of these marginally situated tumours originate in accessory mammæ.

Williams[2] found that in fifty cases of fibro-adenoma of the mammary region consecutively under observation, 7 or 14 per cent were in supernumerary mammary structures quite outside the normal mammæ. I cannot help believing that in many of these the neoplasm was really developed in an outlying mammary lobule, continuous with the real breast. The same author observed the growth of cancer in supernumerary mammæ in 9 per cent, but on carefully reading his cases the same criticism may apply. It is most difficult to be assured that a "string" of mammary tissue does not connect the tumour to the breast, for the lobules of the mamma extend in the most surprising and irregular manner into the tissues round.

In the cases collected from St. George's Hospital, there were many where a fibro-adenoma appeared to be developed in an accessory mamma, which was, however, really an outlying lobule of breast-tissue. The following is a good illustration of a common enough condition :—

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[1] *Path. Soc. Trans.* vol. xxxvii.

[2] *Journal of Anat. and Physiol.* vol. xxv.

A single girl, aged twenty-one, was admitted into St. George's Hospital in July 1878 with a small, hard, movable tumour the size of a hazel-nut at the upper border of the right breast. The notes especially state that the tumour was situated at the upper and outer margin of the right breast, but that it was not perceptibly connected with the mammary substance. The tumour was removed by the late Mr. Pollock, and at the operation it was found that it was connected with the remainder of the mammary substance by a "slender stalk only." Such a case might readily have been put down as an adenoma of an accessory mamma.

In a similar case the tumour seemed to be a genuine fibro-adenoma of an accessory mamma.

A single woman, aged twenty-four, was admitted into St. George's Hospital on 15th October 1879. For four years she had noticed a small lump just above the upper margin of the left breast. She received a blow upon the part five years ago. During the last month the tumour has been exceedingly painful. She was a healthy-looking young woman ; the tumour was situated above the centre of the upper margin of the left mamma. It was about the size of a filbert, hard and very movable. The skin, nipple, and axillary glands were quite unaffected. The tumour was removed by Mr. Holmes. It was "fibroid" to the naked eye, and quite unconnected with the breast.

Cameron[1] quotes a case where a tumour the size of a cricket-ball was removed from the right axilla. It was proved to be an encapsuled adenoma, and the conclusion arrived at was that this had developed in a supernumerary mamma. Numerous cases of this nature are on record, but very careful examination is needful to negative the existence of a string or stalk of true gland substance, connecting the outlying tumour with the breast proper.

Pathology.—If it be once granted that a fibroma of the mamma consists of pure fibrous tissue and nothing else, then it may be at once allowed that such a neoplasm is excessively rare. Mr. Johnson in his lectures at the Royal College of Surgeons supports this conclusion, and states that—

"The vast number of these tumours that are examined contain glandular material, and the disputed question is whether the acinous spaces lined with epithelium are of new formation, or included in the developing fibrous tissue. Those who take the view that glandular tissue plays an important part in the structure, name the tumours fibro-adenomata, by which appellation these growths are most generally known." It is only right to observe that some authors, as Labbé and Coyne, declare that "fibromata" of the breast are common. Thus they found eighteen examples out of a group of thirty-four cases of innocent tumours. Perhaps rigid exclusion of glandular elements was not looked for.

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[1] *Journal of Anat. and Physiol.* vol. xiii.

The names applied to this well-known tumour of the breast are legion. To quote a few we have only to refer to the familiar terms, chronic mammary tumours, adenomata, and adeno-fibromata. It is quite justifiable to call these tumours of the breast fibromata when well-formed fibrous tissue is in excess, and the glandular follicles and cells are scanty and ill-formed. When there is abundance of glandular structure, with well-formed acini and epithelium, many give them the name adenoma. I believe this classification is histologically correct, but I should be loth to attempt to differentiate clinically between these two varieties of tumours. Under the microscope, a "fibroma" of the mamma will be seen to consist of parallel bands, or concentric whorls of fibrous tissue often more or less œdematous or undergoing myxomatous change. Numerous cells are scattered here and there, and these may be generally looked upon as degenerated glandular epithelium. Often the elongated and dilated ducts form branching clefts, easily seen under a low power of the microscope. Cysts are

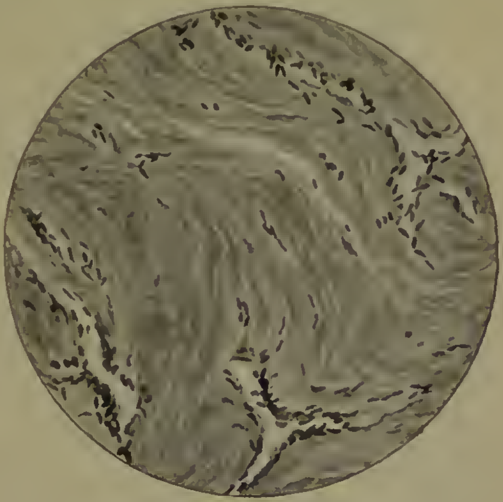

FIG. 25.—Section of a fibroma of the mamma. The glandular elements are scattered and scanty.

exceedingly common, though they may not be observable to the naked eye.

Naked-eye Anatomy.—Fibro-adenomatous tumours are firm, but not stony hard. Their outline is almost invariably slightly bossed or lobulated like a cartilaginous tumour. Should cysts exist, bulging prominences like small grapes will be apparent, and on section, a clear or coloured fluid will squirt forth, the little cavities collapsing. Here and there a coarse granular appearance is seen, due to the transverse section of innumerable dilated ducts. On cutting the tumours across, the section is of an opaque white colour or slightly roseate. Clefts and fissures are often seen, and the cut tumour surface becomes irregularly prominent. It is especially to be remarked that, in the firmer varieties, the resistance experienced on section, is not unlike the sensation of dividing a hard cancer. The cut surface is apt, however, to become irregularly convex. Unless inflamed by blistering, punctures, or manipulation, these tumours are always encapsuled and movable. The frequency of cysts in fibro-adenomata is to be explained by the fact, that secreting lobules of mammary tissue unprovided with ducts, may be included in the tumour growth, or that ducts may be obstructed by contracting fibrous tissue.

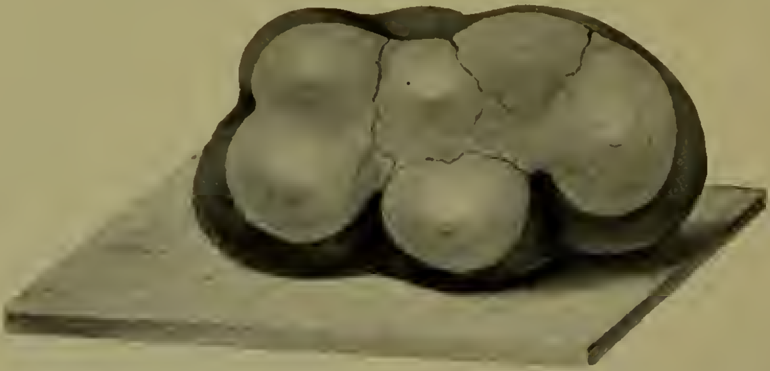

FIG. 26.—Naked-eye appearances of a section of a hard fibro-adenoma; to show the irregular convexities on the surface, the lobulated outline, and the fissures traversing the growth. The drawing is slightly larger than the specimen.

An excellent example of fibro-adenoma undergoing cystic change, usually termed the fibro-cystic tumour of the breast, is as follows:—

A single woman, aged forty-five, was admitted into St. George's Hospital in May 1886. In the upper part of the breast was a hard, rounded, very movable tumour the size of a small orange. The skin and nipple were free. The axillary glands were a little enlarged and tender. There was no distinct history of the time of growth. The age of the patient led to the removal of the entire breast. Professor Delépine made an elaborate examination of the tumour. It was a cystic fibroma with atrophy of the epithelial elements, and no sign of sarcomatous tissue in the stroma, so that the tumour "is certainly non-malignant." "The cysts are formed at the expense of these ducts or acini, which are distended by the accumulation of secretory products."

Stalked Fibro-adenomata.—In a certain number of cases, fibro-adenomata will be found connected by a distinct stalk or portion of mammary tissue, with the surrounding breast substance. The bulk of the tumour is always encapsuled, and this method of development is very suggestive of its origin from some group or cluster of acinous elements, pushing the mammary tissue away from it as it grows.

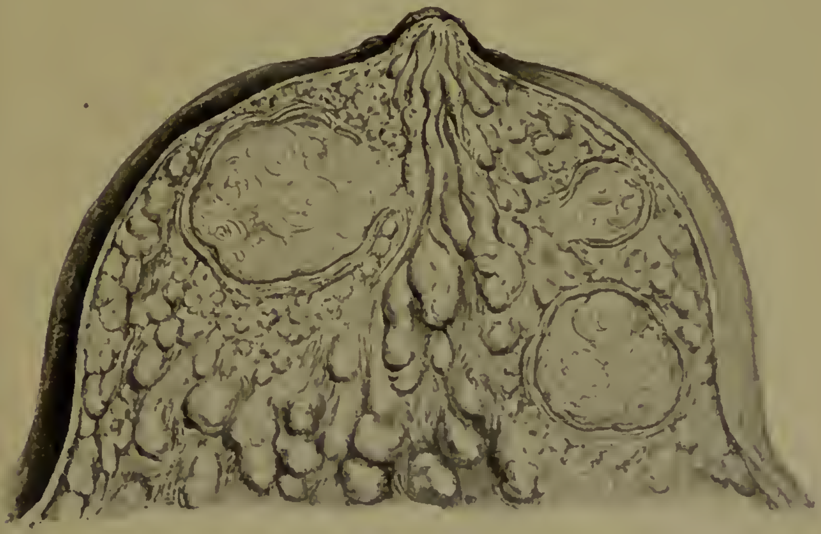

FIG. 27.—A breast containing fibro-adenomatous tumours, two of which are distinctly stalked. All the tumours are encapsuled.

Three important clinical details are here associated:—

(1) That this connection lessens the mobility of these tumours.

(2) That removal is always more difficult, the tumours not readily "shelling out."

(3) That if the tumour be also hard, its fixation may render it liable to be mistaken for carcinoma.

Degenerations.—As has been pointed out, cystic developments from mucoid change or duct-obstruction are the most important degenerations of fibromata. Gross also speaks of "telangiectatic" transformation as evidenced by bloody discharge from the nipple. Of the many examples of fibro-adenoma of the mamma I have examined, I have never known this symptom to occur unless cysts were present. These growths are indeed markedly anæmic, and as the cysts found in them frequently contain fungating growths and vegetations, haemorrhage from the rupture of a vessel in them is far from improbable, and true telangiectatic transformation is not supported by any specimens I have examined.

The large size to which fibroma (fibro-adenoma ?) of the breast may in exceptional instances attain to, is well illustrated by two of Ferguson's cases related in vol. iv. of the *Pathological Society's Transactions.* The tumours are described as weighing 5 lb. and 18½ lb. respectively, but a careful examination of the records make it evident that they contained cysts and intracystic growth. The microscopical examination seemed to prove that the tumours were of the class we are now discussing.

Another instance of the same kind is afforded by a case related in vol. x. of the *St. Bartholomew's Hospital Reports*, p. 150. A woman, aged seventy, had a "mammary glandular" tumour, which was removed with but little loss of blood. After being drained of fluid, contained in numerous cysts, the mass weighed no less than 8 lb. The patient died twenty-six days after the operation. A tumour, which weighed 7 lb., and had grown for thirteen years, is preserved in St. Bartholomew's Hospital Museum. The patient was a middle-aged woman, and used to nurse the tumour on her knees.[1]

A large tumour of this nature was excised by Cruveilhier, and the case is related in the *Bulletins de la Société anatomique* for May 1873. The greater mass of the tumour was hard and fibrous, and it contained large cysts. A point of additional interest in this specimen was the presence of a mass of bony material embedded in the fibrous mass, resembling in shape the head of the femur.

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[1] 3161, Museum of St. Bartholomew's Hospital.

A specimen which also contained cysts was exhibited at the Pathological Society of London on 3rd May 1892. It weighed 8 lb. 7 oz., had been growing four and a half years, and originating close to the mamma, it displaced the breast substance. Another excellent example of the great size fibrocystic tumours of the breast may attain to is given by Banks (*Clinical Notes*, 1884, pp. 56, 57). The drawing gives a good idea of the huge size of this growth. The patient, a woman aged thirty-one, had borne this formidable tumour for ten years, and was at last compelled to carry it in her arms like an infant. It was removed by being held up by assistants. Its base was compressed by a rubber cord, and it was rapidly removed, large sponges being pressed upon the bleeding surface. The hæmorrhage seemed to have been readily controlled.

It must be remembered that if fibro-adenomata remain untouched, they may slowly grow and first be exhibited by the patient in extreme old age. Thus Bryant speaks in the *Guy's Hospital Reports* for 1864 of having seen an adenoma in the breast of a woman of seventy-three which was the size of a "soup-plate," and had existed for fifty years. The tumour was movable upon the chest, and the general condition of the patient not seriously affected. We seldom, if ever, see such huge formations in these days, but such a case as this affords a striking instance of the innocency of this class of tumours.

Again Bryant in 1865 removed a tumour of this nature the size of a cocoa-nut, and the growth being examined microscopically, was pronounced by Moxon to be an admirable example of "the more fibrous kind of adenoid structures."[1] In the chapter on hypertrophy of the mamma, it is pointed out how readily these large tumours and the condition of mammary hypertrophy may be confused, and a case is quoted in point.

Instances are on record to show, that small as well as large fibro-adenomata may as rarities exist in the breasts of elderly women. They then get hard, and are often adherent to their capsules, and may closely simulate the firmer kinds of carcinoma.

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[1] *Path. Soc. Trans.* vol. xvii.

A widow, aged forty-two, was admitted into St. George's Hospital on 30th July 1884, with a hard tumour described as the size of a Tangerine orange deep in the left mamma. There was no evidence as to how long it had existed. The axillary glands were not affected, but no note is made as to the condition of the nipple or skin. An exploratory incision was made, and the tumour was so hard that it felt almost gritty. The whole breast was removed. Examination with the microscope showed that the tumour was an exceedingly hard fibro-adenoma. It was definitely encapsuled, but adherent to its capsule by inflammatory material, having thus lost the mobility so characteristic of fibro-adenomatous tumours.

Instances such as this are probably exceptional, and such tumours, were reliable history obtainable, would have remained in the mamma for many years, originating in early youth. Actual calcification of these tumours is very rare. I have never met with a case. Gross puts calcification of fibromata as high as 6 per cent. The recorded cases in this country will hardly bear out this assertion. The same authority quotes Leloir[1] as removing a true spongy osteoma as large as a pigeon's egg from a cystic myxomatous fibroma. Professor Annandale asserts, in his article in Ashurst's *Encyclopedia of Surgery*, that he once removed a "fibroma" which had become converted into a bony mass. In one of Halstead's cases of scirrhus, quoted in the *Annals of Surgery* for 1894, mention is made of a mass of bony hardness being associated with the cancer, and this turned out to be a "calcified fibroma."[2]

Many other instances of large fibrous tumours of the mamma are published, and they usually contain cysts. Gross refers to cases by Demarquay, Labbé, and others, where these tumours were described as the size of a fœtal or adult head, and weighing 8 lb. in six, and 29 lb. in seven years. While the rate of growth of a solid fibroma is slow and constant, the reverse is the case when cysts form, for then these tumours grow by fits and starts, and sometimes increase alarmingly, especially during pregnancy or lactation. They may also suddenly diminish from the evacuation or collapse of a cyst.

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[1] *Gazette médicale de Paris* for 1878, p. 645.

[2] It is worthy of remark that in several cases like those of Halstead and Gross, when fibro-adenomata are associated with scirrhus, they become calcified.

The largest tumour of this nature I know of in literature is alluded to by M. Velpeau, in the preface to his work; he states it was over 40 lb. in weight. The vast majority of cystic fibro-adenomata, which will come under notice, are not larger than an orange. In modern days patients rarely bear these tumours long enough for huge cysts to form, with masses of growth leading to fungation and chronic misery.

Clinical History.—The clinical story of the firm fibro-adenoma may be easily told. The tumours are exceedingly slow in progress, and seldom grow to a larger size than that of a walnut, or, at the most, a hen's egg. If cystic change occurs in them, however, they may, as years roll on, attain to great dimensions from rapid secretion or intracystic bleedings. Most of them are painful, and the patients complain of neuralgic sensations shooting down the side of the arm and over the chest. Such pains may be worse at the menstrual epochs, and are generally increased by handling. Furthermore, it is often the smallest tumours which are the most painful. Some small hard fibromata, the size of a hazel-nut or haricot bean, suggest in their symptoms the painful fibroma found in the arm or neck, or other parts of the body. These growths were often called by our forefathers the irritable tumours of the mamma, and the name is a good one, and more worthy of being preserved than many others, though the same appellation was unfortunately given to hard inflammatory indurations. The pains of these tumours terrify women with the apprehension of cancer. The subjects are often anæmic, neurotic girls with constipation and scanty painful menstruation, and most authors affirm that there is a connection between the faulty menstruation and the breast tumour. This is a mere statement, and so far as I know is not founded on any true scientific explanation.

Mobility is very marked, and I should certainly assign to this symptom a leading place. The tumour can be felt to roll about in the breast substance beneath the flat fingers. Though close to the skin the latter is unimplicated, and the nipple is not retracted unless there should be associated inflammatory changes. Severe blistering, much handling, and especially exploratory puncture may easily involve these tumours in inflammatory processes, and materially alter their leading clinical characteristics. No correct estimate can possibly be made of the size and nature of these tumours of the breast during lactation, when the mammary gland is vascular and hyperæmic.

In rare instances mammary inflammation takes place round fibro-adenomata, and in still more exceptional circumstances gout may attack a breast tumour of this nature.

A case to show this is related by the late Mr. Campbell de Morgan of a stout woman of fifty, who had a tumour of large size in the left breast. She had an attack of ordinary gout in the toe. While the gout was still severe in the toe, the breast suddenly increased to twice its former size, and became intensely painful and red. As the gout subsided this went down, and the tumour returned to its previous size. After removal, the tumour was pronounced to be of the nature of fibro-adenoma. Mr. de Morgan pronounces the attack of gouty inflammation in this tumour as quite undoubted.[1]

There is not wanting evidence to show, that even firm and non-vascular fibro-adenomatous tumours, may undergo great increase in size during pregnancy or lactation, to afterwards subside. The remarkable case of Dr. Ashwell, figured in the *Guy's Hospital Reports* and in Bryant's work, well illustrates this. The tumour increased enormously during each pregnancy and lactation, so as to weigh upwards of 20 lb. Yet on removal by Stanley in 1843 the growth had reduced to 7 lb., and the greater part of the breast was left unimplicated.

When these tumours are allowed to attain to great dimensions, which in the anæsthetic days of modern surgery is exceptional, cysts will usually coexist with abundant intracystic growths. Hæmorrhagic or mucoid discharges from the nipple, even to a considerable amount, are then common. The skin may give way from pressure and tension, and the intracystic masses fungating out, and copiously exuding a foul watery or purulent discharge may readily be mistaken for cancer. The distinctions are obvious, for in the innocent tumours the disease will have existed for many years, and the skin is perfectly "clean cut" at the edges of the aperture, not hard, infiltrated, and adherent. The lymphatic glands are never implicated by the growth. They are sometimes enlarged and tender, but disappear after removal of the tumour. If fibro-adenomata of the mamma endanger life, it is only by hæmorrhagic or exhausting discharge, or in extremely rare instances, in huge tumours, by penetration of the thorax by pressure and absorption of the ribs. These tumours are not uncommonly multiple in the same breast. They may be found on both sides, and when very small some of them may readily be overlooked. It is most important to observe that, however large, these tumours grow, they do not infiltrate the breast, but push the mammary tissue aside, so that a large growth of many pounds in weight may be removed, leaving a healthy mamma behind.

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[1] *Path. Soc. Trans.* vol. xxi.

Fibro-adenomata of the mamma are typically benign tumours. Yet instances of recurrence are not unknown, and Gross places the proportion of return as high as 6 per cent. I cannot but think that the true explanation lies in the fact that other tumours, small in size, have been overlooked, or have arisen *de novo* in other parts of the breast, it may be closely adjacent to the site of operation. Should a fibro-adenomatous tumour return *in loco* when thoroughly removed, it may certainly be assumed that the diagnosis was faulty, and that the original growth was truly a sarcoma. The microscopical distinctions between the firmer varieties of spindle-celled sarcoma and developing fibrous tissue are, in my belief, somewhat untrustworthy, and a cautious surgeon will never give a positive prognosis as to recurrence, unless the innocent nature of the tumour clinically, to the naked eye, and under the microscope, should be very marked. In large tumours containing blood-cysts, sarcomatous elements are often found, even though the tumours have been of slow growth, and caution should be exercised in the prognosis.

Thus, at a meeting of the Liverpool Medical Institution on 17th December 1896, Mr. Mitchell Banks showed a woman from whose breast he had removed a large cystic adenoma, about 15 lb. in weight, sixteen years ago. Three years after this operation he removed a small recurrent growth. At the present time there was again a tumour about the size of a large orange, which had grown in the last six months. All these tumours had attacked the left side—that from which the breast was originally removed. Such cases teach us caution in prognosis.

Through the kindness of Mr. H. Lunn I had the opportunity of seeing at the Marylebone Infirmary in 1897 a shrivelled Irishwoman, whose age was reputed to be 102. She looked quite this age, and was querulous and demented, so that no reliable history could be obtained of her malady. In the left breast was a truly remarkable tumour the size of a large orange. It was hard, but obviously contained cysts in some places. The nipple was retracted, but the skin non-adherent. No glands could be felt affected. The tumour rapidly increased in size. She died of carcinoma of the pylorus as proved by examination in October 1897. The breast tumour on being cut across contained large cysts filled with blood, which had obviously issued from some fungating papillary excrescences on the walls of the cysts. The substance of the tumour itself was tough and leather-like, but the most careful examination by my colleague, Dr. Rolleston, failed to find anything of a carcinomatous nature. The growth was purely fibrous, being indeed an example of the fibro-cystic tumour of the mamma formerly so often spoken of. The rapid increase was due to slow bleeding into the cysts, and this led me during life to erroneously suspect that the growth was carcinomatous.

Part of the tumour was composed of dense fibrous tissue, other parts showed a rapidly growing small round-celled sarcoma. Thus, had this tumour been removed during life, it would likely enough have recurred, though the main bulk of it was certainly fibrous. It may be named a fibro-cystic tumour of the mamma undergoing sarcomatous change, and I believe it is the oldest case on record of a breast tumour of this nature.

It is asserted that fibro-adenomata of the mamma spontaneously disappear, and numbers of cases are related which go strongly to prove this statement.

Paget long ago referred to the occasional disappearance of mammary glandular tumours, when any imperfection of the uterine or ovarian functions in which they may seem to have their origin, is repaired by marriage or pregnancy.[1] I shall speak strongly for not allowing this statement to influence the decision of removal, having been especially struck with the tenderness and pain about these tumours after matrimony.

The diagnosis between localised areas of hyperplasia from mastitis, or small cysts surrounded by indurated tissue is far from easy or positive, and the true explanation of the "dispersion" of breast tumours by ointments and liniments may probably be sought in this direction. A true, mobile, solid new growth is hardly likely to disappear spontaneously, though in the face of strongly expressed beliefs on the part of authorities I would not absolutely deny the possibility of such an occurrence.

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[1] *Lect. on Surg. Path.* 1870, p. 564.

Such a case is the following:—

A lady's-maid, aged twenty-three, was admitted into St. George's Hospital on 19th July 1882. Six months before admission she noticed a lump in the left breast. The tumour is described as fully movable, not hard, the skin unimplicated, no retraction of nipple. A belladonna plaister was applied, and iron given internally. On 18th August it was noted that the tumour had almost disappeared. On the 24th August she was discharged, the tumour had gone, but there was some slight return of pain under the left breast. The tumour had been diagnosed as "chronic mammary." It may quite possibly have been inflammatory, or a small cyst; the evidence of true tumour growth was not clear.

Recorded cases go to show, that cysts of tangible dimensions are more common in the fibrous and glandular tumours, at the time when secretory force is active. Thus a fibro-adenomatous tumour in the breast of a young girl of sixteen will be devoid of cysts, whereas in a woman of thirty-five cystic formations will be probably present. Huge cysts, with abundant intracystic growth, are generally not found until after the age of thirty.

There can be no doubt that cysts form in fibrous and fibro-adenomatous tumours in a great variety of ways. Mucoid softening and blood extravasations are probably not so common as in the softer and more succulent varieties of this group of tumours. It is in the ducts that we have especially to look for an explanation of cystic formations in the firmer varieties of innocent mammary tumours. The latter are not only obstructed with consequent local dilatations, but they are also dilated along a considerable extent of their course by the extra-canalicular contraction of fibrous tissue. And thus under a low power of the microscope, or even with the naked eye, numerous cracks and irregular channels may easily be seen. Such cystic formations are sometimes simple, lined with endothelium, and filled with a mucoid fluid of a clear or straw colour. More often, however, intracystic growths sprout from the glandular epithelium of the walls of the cyst of every kind of shape and form, of varying consistence and complexity. These may completely fill the original cyst so as to form a solid tumour. There is good reason to think that adenomatous tumours sometimes form in this way, though much more rarely than one is generally led to believe, or on the other hand, papillary outgrowths may coalesce enclosing spaces between them, and thus forming secondary cystic spaces. It would be impossible to describe all the possible forms assumed by the masses composed of connective tissue and glandular elements which project into the cysts in these cases, but the dendritic type, as best exemplified by a twig bearing oak leaves, is usually closely imitated.

There is yet another possible method by which cysts may form in glandular tumours, *i.e.* by the close packing of acinous spaces with cells. Dilatation of the acini, and subsequent mucoid softening of the cells contained in them. An excellent illustration of this process is given by Ferguson.[1]

The surgeon may suspect that a firm fibrous or fibro-adenomatous tumour of the breast contains cysts by the following signs:—

(1) The patient will probably be over thirty years of age.

(2) The tumour may have shown sudden and capricious variations in size. Active enlargement causes alarm, and sudden subsidence hope, and the latter symptom may be associated with discharge from the nipple of blood, or bloody fluid, or viscid straw-coloured exudation. This may be only caused by pressure of the hand of the surgeon, but is a symptom of value if elicited.

(3) The bulging prominences of the cysts, if of any important size, may be seen, and if the skin is much distended, the bluish tinge of the contained fluid is easily to be detected, while a sense of elasticity, or more seldom that of fluctuation, is experienced by the fingers of an adroit observer.

(4) When the cysts are small, as is often the case, they are so tense as exactly to simulate solid growth, and even after removal of a firm fibrous or adenomatous tumour, it is impossible to be certain it does not contain cysts. On section one or more cystic cavities the size of a pea or grape may be

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[1] *St. Bart. Hosp. Reports*, vol. xx. p. 254.

disclosed, with thick walls, from which on section the fluid jets forth with vehemence.

The purer forms of adenomatous tumour, containing glandular material as the main bulk of the growth, are, I believe, more common than pure fibroma. Gross believes, however, that pure adenoma is excessively rare, and states that he has met with it only twice in six hundred and forty-nine tumours of the breast. I have met with several specimens very closely approximating to pure glandular tissue. One specimen removed at St. George's Hospital was examined by Prof. Delépine and stated to be a pure adenoma. A rough sketch of the appearances is given by the registrar, and they are suggestive that the case is genuine. A very similar specimen was shown by Power.[1] The microscope alone can make the diagnosis even approximately certain, but I know of no useful clinical distinction between a tumour composed of pure glandular elements, and one in which fibrous tissue in various stages of development is mixed. Practically the common type of the fibro-glandular group of mammary tumours is always composed of the same kind of structure—glandular acini lined with columnar epithelium and abundant, interstitial, nucleated, connective tissue.

In some specimens of these tumours, the acini lined with glandular endothelium will be enormously increased, and to this type the name of acinous adenoma is often applied. When the ducts are much dilated and filled with dendritic growths, the name of tubular adenoma is often used. Many observers term tumours of the latter kind "duct

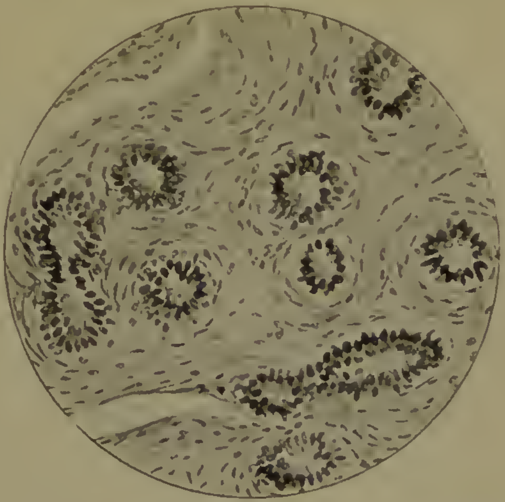

FIG. 28.—Section of the common fibro-adenoma of the mamma.

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[1] *Path. Soc. Trans.* vol. xxxvi. p. 411.

papilloma." Still we may consider that a duct papilloma, so long as it is innocent and the epithelium is contained within the walls of the duct, is essentially an adenomatous formation, and perhaps the term tubular adenoma is the preferable one.

It is stated by many pathologists that secretory ducts are usually not found in these tumours. Birkett, writing in *Guy's Hospital Reports* as long ago as 1855, mentions a large cystic adenoma where one of the cysts contained milk. He refers to another instance which occurred in the practice of Mr. Nathaniel Ward, at the London Hospital. Bryant quotes two instances of secretory ducts in fibro-adenomatous tumours in women, aged twenty-one and twenty-three years respectively. In the second case, the patient is stated to have been a virgin, which is very remarkable, as secretory ducts filled with milk and colostrum particles were described. In the first case, a married woman under Mr. Bryant's care, some of the ducts terminated on the surface of a cyst, which contained a substance resembling soft cream. The secretory function may therefore be carried on in adenomatous tumours, but this may be looked upon as quite exceptional. I have, however, met with one such case, it is as follows:—

A woman, aged fifty, was admitted into St. George's Hospital in September 1888. She had been married, and suckled two children. She had noticed a large tumour in the left breast for two months. The tumour is described as being situated at the upper and outer part of the mamma. Hard, heavy, the skin not adherent, but the nipple deeply retracted. Removal of the whole breast was carried out. The tumour proved to be a large and hard fibro-adenoma. On cutting it across there were numerous cystic cavities, some of which had small papillary growths on their walls. The cavities were filled with "a grayish creamy fluid" containing fat and colostrum corpuscles. This fluid was certainly altered milk, and the case is probably one of secretion within a tumour.

The history of duration of the tumour in this case is probably delusive.

Gross also speaks of a variety of adenoma where ducts are especially developed. This he names tubular adenoma. From the accounts of genuine adenomatous tumours, which I have perused, the type seems to be pure glandular formation, and the more closely this approaches to the character of well-developed mammary tissue, as in the breast of a parturient woman, the more characteristic of true adenoma it seems to be. At the same time, many of the spaces lined with epithelium are really ducts cut across, and my own opinion is strongly in favour of the belief, that adenomatous tumours contain ducts in great abundance. When the acinous spaces are very closely packed with epithelium, the cells may become concentrically arranged, filling the acini entirely. Most unfortunately the term epithelioma has been applied to this form of tumour. Such a nomenclature receives the support of Billroth, with whom I believe it originated, and certain French authors also adopt it. I do not hesitate to affirm that nothing is so calculated to confuse students and mislead practical surgeons as pathological statements of this kind, and I only mention the term epithelioma, in connection with intra-acinous cellular formations in adenomatous tumours, to condemn it.

It may also be mentioned that the glandular epithelium in fibro-adenomata, is apt to undergo caseation and fatty degeneration, and on squeezing the tumour yellow plugs are sometimes expressed of this nature. To these the term atheroma has been perhaps unwisely applied. Such formations are merely masses of cells undergoing fatty degeneration and molecular disintegration.

Treatment.—I have already alluded to the fact that fibro-adenomatous tumours are sometimes difficult to distinguish from localised inflammatory indurations and cysts, and hence that it is fashionable to apply to them "absorbent remedies." In the case of an encapsuled, movable, definite tumour, I have seen nothing but harm result from blistering and mercurial plaster or frictions. If the tumours are small, and giving no great inconvenience, they may for a time be left alone. Otherwise they should be removed, and operation should always be advised if they are increasing or if marriage be contemplated; for under the stimulus of pregnancy and lactation, as has been mentioned, very rapid increase may occur, with great painfulness and local annoyance.

I would venture, at the risk of repetition, to draw very forcible attention to this important practical point. If a young woman be allowed to marry, bearing in her breast a fibro-adenomatous tumour, she will certainly regret it, as the growth will become most painful and troublesome.

The removal of fibro-adenomatous tumours is usually looked upon as a very simple affair. Speaking from experience, I may say that unless very elaborate care be taken, there are few cases more likely to give trouble in the healing process. Indeed, these operations, trivial as they seem, have given more anxiety in sound healing, than removal of the entire breast. The cause is not far to seek. A cavity, often of some depth, is made in the breast-tissue, and blood and serum are peculiarly likely to collect there. Should sepsis occur, purulent mastitis with burrowing abscess may readily ensue. The consequences of this are very disastrous, and serious scarring and deformity of the breast may arise from the necessity of counter-openings and introduction of tubes, the surgeon being justly blamed.

A young unmarried woman, aged twenty-three, was operated upon at St. George's Hospital in June 1885 for an "adenoma" of the breast. The wound did not heal well, and when the patient went to the Convalescent Hospital at Wimbledon there was still some discharge. A full six weeks after, sudden profuse bleeding occurred and the wound had to be reopened. On 18th September an abscess burst spontaneously in the breast, and she was readmitted to St. George's Hospital. On 23rd November another attack of bleeding occurred, and the sinus had to be plugged with gauze. Abscesses again burst or were opened in December and January 1886. In the latter month no less than three abscesses formed and burst. She was finally discharged in April, her illness having lasted nearly twelve months. It is interesting to observe that this patient developed an angular curvature in the dorsal region in the middle of her illness, but this did not appear to have any direct relation to the breast trouble. A more striking instance could hardly occur of the troublesome suppurations that may occur after operating deep in the mamma, unless the most elaborate care be taken to ensure drainage in dependent positions, coaptation of the deeper parts of the wound and absolute asepsis.

A single woman, aged forty, was under my care in St. George's Hospital in February 1895. A fibro-adenoma was removed from the left mamma in the previous January and the wound soon healed. She was discharged apparently well. Some sepsis, however, must have occurred at the operation, for soon she complained of heat and throbbing about the wound, and an abscess formed in the site of the tumour, extending some depth into the breast. This was opened and drained, and she made a tedious recovery.

I have seen several similar cases in the practice of others, and the knowledge that such disasters may occur will lead to elaborate care in operating.

The mode of operation is as follows:—The surgeon's hands, those of his assistants, and all instruments being rendered perfectly aseptic, the tumour is squeezed prominently forward by the finger and thumb, and an incision made down upon it with a sharp knife in a direction radiating from the nipple. Peculiar care should be taken to cut until the tumour substance itself is seen, and not to dissect outside the capsule, which is composed of condensed mammary tissue. If this common error be made, the surgeon will find that he has committed himself to a tedious dissection, and that he will leave behind a deep and ragged cavity. In a certain number of cases, when the tumour is properly exposed, it shoots out of its capsule with ease, like a cherry-stone propelled from between the finger and thumb.

I have been often struck in removing fibro-adenomata with the fact, that the growth may be connected with a thin process of mammary tissue, and sometimes the connections are quite extensive. The edges of the wound, should glandular connections exist, must be well held asunder with retractors, and the tumour being grasped with clawed forceps should be carefully dissected out. The surgeon will find that the bleeding is troublesome. The vessels retract into the mammary tissue, and it is difficult to secure them. All that spout definitely must be twisted, and strong "clip" forceps must be placed upon all bleeding points, the parts being strongly flushed with hot water. No time must be spared in checking all hæmorrhage before the superficial parts of the wound are closed. If this is impossible, it is far better to pass the sutures and tie them loosely, tightening them gently at the next dressing, after the fashion long ago adopted by Syme. In my own practice I pass a series of fishing-gut sutures very deeply, to approximate the extreme depths of the wound, and unite the skin with scrupulous care with horse-hair. A thick horse-hair drain is always employed, and is usually removed on the fourth day, being gradually shortened. The skin of the mamma being very sensitive, I usually avoid strong chemicals and dress these cases with boric, or wood wool, sealing the wound, excepting where drainage is provided for, with collodion and iodoform varnish. A soft sponge in the dressings makes equable pressure, and is a very important adjunct. When such precautions as these are taken, healing is usually very rapid and satisfactory. The arm must be fixed to the side during the healing process. When several tumours exist, they should be removed through the same incision if possible; I have done this on several occasions.

A pale anæmic servant, aged fourteen, was under my care in St. George's Hospital in July 1895, with multiple adenomatous tumours in both breasts. There were three tumours in the right breast, two in the left. The growths varied in size, being about as large as filberts in the left breast, and that of walnuts in the right. They were very movable. A single, rather free, incision was made over the locality of the tumours in either breast, and through the single opening in each mamma the tumours were removed, being squeezed into the wound, their capsules freely divided, and the growths "shelled out." Great pains were taken to ensure free drainage and adjustment of the depths of the rather complicated wound. Buried sutures of catgut were employed. The case did well in all respects.

If the tumour is superficial and very movable, it may be removed by the aid of cocaine.

For five months a single woman, aged forty-one, had a tumour the size of a walnut in the upper part of the right mamma. It was hard and exceedingly mobile. Cocaine in a 2 per cent solution to the amount of a quarter of a grain was injected subcutaneously, and an incision made under full aseptic precautions through the capsule of the tumour, which was "squeezed up" with the finger and thumb. The pressure being continued the tumour shot out of its bed. Horse-hair sutures were deeply introduced, and the wound rapidly healed. The little operation was performed in the out-patient department of St. George's Hospital on 23rd January 1896.

Fibro-adenomata, though apparently movable, are not always really so. An inexperienced operator will do well to remember this. Personally, I always like to place my patient under an anæsthetic, the effects of which are not too transient. I have on several occasions seen these operations attempted under nitrous oxide, and the patient having returned to consciousness before the tumour was removed, the situation became exceedingly embarrassing.

A girl, aged fifteen, was operated upon by me in the out-patient department of St. George's Hospital on 8th April 1896, for a hard, elastic, well-defined tumour the size of a walnut, situated just above the right nipple, which had existed for nine months, and was apparently quite movable. A smaller tumour, the size of a filbert, was situated below the nipple. The larger tumour was connected with the mammary substance by an ill-defined stalk, and, moreover, was adherent to its capsule, so that a tedious dissection was required. The smaller tumour was also adherent, and a portion of mammary tissue had to be removed with it. My colleague, Dr. Rolleston, pronounced both these tumours to be typical fibro-adenomata. From their mobility, easy removal might have been expected.

Gaillard Thomas's Operation.—Writing in the *New York Medical Journal* for 1882, Gaillard Thomas ingeniously adopts a method of removing these tumours which leaves no scar on the front of the breast. He makes an incision in the thoraco-mammary fold, and raising the breast cuts on to the tumour from behind and enucleates it. Excellent in theory, this operation is not always easy in practice, and its adoption will a good deal depend upon the position and mobility of the tumour. A movable growth in the lower part of the breast in a woman, to whom a scar was of great consequence anteriorly, may thus be treated. I have performed the operation on two occasions. The first case was simple, since the tumour was easily reached from below. In the second case, the growth was unexpectedly adherent, and I experienced great difficulty in its removal, and also in the checking of hæmorrhage. Both cases did well, and the resulting scar in the fold between the breast and the thorax was hardly visible. The difficulties of the second case, however, would deter me from again performing the operation unless in a very accessible and movable tumour. It may be remarked that some tumours can be reached from the axillary margin of the breast, where a scar is much concealed from view.

Highly successful cases of this operation are quoted by Jamieson[1] and Hayward,[2] while Bryant merely alludes to it. Doubtless, if a careful selection of cases be made, this operation may prove most advantageous and valuable.

The surgeon may bear in mind the following practical points, should he chance to have to operate upon an enormous fibro-adenomatous tumour of the breast:—

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[1] *Brit. Med. Journ.* 1888, vol. i. p. 1216.

[2] *Ibid.* 1889, vol. i. p. 410.

(1) That the growth will increase in pregnancy and lactation, but will markedly diminish afterwards.

(2) That operation should not be done during these periods; and that an attempt should always be made to save the breast and nipple, which will probably be distinct from the tumour.

It may, lastly, be pointed out that in some cases fibro-adenomatous tumours are so surrounded by inflamed and indurated tissue, that it is difficult to define their outlines, or be sure whether they are true tumours or masses of chronic mastitis.

A married woman, aged forty, a patient of Dr. Dunbar of Clapham, was admitted into St. George's Hospital under my care in January 1894. She gave the history, that she has had a hard lump the size of a nut in the left breast for about two years. On examination in the axillary part of the right mamma was a hard rounded tumour the size of a pigeon's egg. The skin was quite free, the nipple not retracted, the axillary glands were not enlarged. The breast was nodulated and hard in the immediate neighbourhood. A wedge-shaped portion of the mamma was removed including the tumour, and the wound soon soundly healed. The portion of breast tissue removed, was firm and obviously chronically inflamed. There were several small cysts. The tumour was a hard fibro-adenoma, almost a pure fibroma, as the glandular elements were very scanty. It was incorporated with the inflamed tissues round it.

Prognosis.—Great caution should be exercised regarding the question of recurrence of these tumours. The hard, movable, encapsuled fibro-adenoma in the breast of a young woman which slips out of its capsule, never returns. But here it must be remembered that such growths are often multiple, and that at the very time a too confident surgeon is promising freedom from recurrence, other tumours in what may be termed an embryonic condition are already growing, soon to become manifest to discredit his prognosis and to lead to concern and alarm. The possibility of such an occurrence should be clearly explained, and if fresh tumours show themselves they should be removed by simple incision. Again, it is well to observe that the distinction between sarcoma and some of these tumours is, even with the microscope, by no means clear. Every practical pathologist knows how difficult it is to discriminate between developing fibrous tissue, and sarcomatous growth. This accounts for the fact that in some cases termed "adenoma" inveterate recurrence and malignancy have been observed. Such cases are really of a sarcomatous type and should be so considered. Verneuil especially draws attention to the mixed nature of some apparently innocent mammary tumours, and relates how they are followed by malignancy.[1]

Lastly, carcinoma has been known to invade fibro-adenomatous tumours, or to grow in the scars made by their removal. All such cases are highly exceptional, and a perusal of the illustrative examples given towards the end of this chapter, will make the matter sufficiently clear to the reader to prevent his falling into error regarding a subject fraught with difficulty in practice.

As an example of the caution that should be exercised regarding the prognosis of even certainly innocent mammary tumours, the following cases will well repay perusal. There can be little doubt in all of them that a small fragment of mammary tissue was left behind which again took a cystic change. This case affects a strong argument for very free removal of all breasts, associated with growths containing cysts and solid material.

A married woman, aged forty-six, was admitted into St. George's Hospital under Mr. Pick's care on 23rd October 1895. Four years before she had the right breast removed. She remained quite well until about nine months ago when the present tumour appeared. The former operation was performed in St. George's Hospital. I found the records of it, and the growth was pronounced by an unquestionable authority, Professor Delépine, to be a large cystic adenoma of an innocent nature.

The woman was now in good health and condition. In the outer part of the scar left by removal of the right breast was "an irregular growth the size of the closed fist."

The axillary glands were not affected, the tumour moved in subjacent parts, it fluctuated, and the skin over it was much thinned. The tumour was removed and the patient made a good recovery. The growth was examined by my colleague, Dr. Rolleston, who reported it to be a cyst with numerous pedunculated intracystic growths, which microscopically are composed of œdematous connective tissue. In these involutions of the fibrous tissue of the cyst wall no definite gland tubes can be seen. The tumour was of a perfectly innocent nature.

A single woman was in St. George's Hospital in 1878. She then had a coloured discharge from the nipple, and a swelling in the mamma which was opened, and was apparently a cyst. In 1880 the swelling had returned, and then a definite tumour was removed, but not the whole breast. The nature of this was doubtful. In 1887 she was again admitted, and at the axillary end of a long cicatrix was a not very hard movable tumour about 3 inches in diameter. This, after free removal, was examined by Professor Delépine. It had the structure of a "cyst-adenoma." The large accumulation of epithelial cells in various places made the examiner suspect that other parts of the tumour might be of a more malignant nature.

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[1] *Gazette des Hôp. de Paris*, 1882, p. 673.

On 14th August 1862 a tumour was removed in St. George's Hospital by Mr. Lee from the left breast of a widow of sixty. It was 2 lb. in weight, and consisted of a series of "cells" (cysts) containing thickish material, and having growths from their walls "like the chronically inflamed fimbriæ of serous membrane." This growth was obviously what we should now call duct papilloma. All went well for five years, when, without reason, the growth suddenly reproduced itself in the scar, and in a few months presented itself as a large bleeding mass. This was again freely removed by Mr. Lee, and the structure of the second tumour was almost identical with that of the first, being composed of a multitude of cysts with intracystic growths.[1]

Such cases as these may be classified as examples of duct papillomata with excessive intracystic growth, and the suspicion of them containing sarcomatous or carcinomatous elements is always present. The practical point that apparently innocent tumours containing cysts and growths may recur in the scar, even after four or five years, is sufficiently exemplified, and is an argument for exercising the extremes of caution in prognosis.

A healthy, single woman was admitted into St. George's Hospital on 1st November 1893, with a slowly growing, movable, lobulated tumour in the upper part of the right mamma. She had noticed this formation for about eighteen months. The nipple was not retracted, the skin was not adherent, there were no enlarged glands in the axilla. It was noted that the tumour did not "shell out" of its capsule as readily as is usual in this class of growths, but required some dissection. Dr. Rolleston made the following important report regarding this specimen. Part of it is an old fibro-adenoma. In other parts the fibrous tissue is young instead of being old, and well formed, and is œdematous. In this area there are gland tubes full of epithelial cells showing rapid proliferation, and in a few places forcing their way through the basement membrane, and threatening to infiltrate the surrounding tissues. A "precancerous" condition. Conclusion: An old fibro-adenoma. In parts of it there are changes suggestive of commencing carcinoma.

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[1] This may have been an instance of villous duct cancer.

This case is very instructive in the light of others where carcinoma has actually arisen in the scars left by removal of adenomata. It must be remembered, however, that epithelial proliferation is not uncommon in the immediate vicinity of adenomata, and this may be due merely to the irritation caused by the growth of the neoplasm.

Gross[1] figures a remarkable case, where an adeno-fibroma in the breast of a woman seventy-four years of age, was gradually transformed into an osteoma by calcification, and finally carcinoma was engrafted, as shown in his illustration.

A remarkable, and almost unique case of an "adenoid growth" being associated with cancer is related by Pick.[2] The primary growth was carefully examined by the Morbid Growths Committee, and was said to be a cystic adenoma with a large cyst, and polypoid masses of tumour growth in its interior. Five years after the removal of this tumour by Sir P. Hewett, the axillary glands rapidly enlarged on the same side. They were not affected at the time of the operation. The glands were declared to be cancerous, and the author seems to have no doubt of their nature. On carefully and critically reading this important case, it is to be regretted that a more detailed account of the microscopical appearances of the glands is not given. The question of sarcoma or duct carcinoma must arise in the minds of modern pathologists. One of the plates drawn by Dr. Moxon is suspiciously like what is now termed villous duct cancer, and I should regard this as being the true explanation of the case. An unusually large cyst had occurred in the primary growth with papillary projections, and subsequent epithelial infiltrations of its walls.

Williams[3] relates the case of a single woman, aged twenty-two, who came under his care with a tumour the size of a filbert in the left mamma, close to a small scar resulting from the excision of a similar tumour eighteen months before. He removed it, and the microscope revealed fibro-adenoma. Three and a half months later the patient returned with a similar tumour in the same situation, which was again excised. Here there can be no doubt that fresh tumours formed. Probably there were small ones present, though not noticed at the time of operation. But will such an explanation hold water for the following cases?—

In a woman, aged twenty-two, eighteen months ago a small adenoma was dissected out of the left breast. Fifteen months later she first noticed the present disease in the same situation as before. The tumour was again excised. She was readmitted three and a half months later with a fresh nodule in the old situation, which was excised. Microscopically, the tumour was a fibro-adenoma.[4]

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[1] *American System of Gynæcology*, vol. ii. p. 205.

[2] Vol. xx. of the *Path. Soc. Trans.*

[3] *Diseases of the Breast*, p. 481.

[4] *Middlesex Hospital Reports*, 1883, p. 394.

A single woman, aged thirty-four, was operated upon in St. George's Hospital in 1883 by Mr. Pick for a "chronic mammary tumour." This was examined with the microscope and found to be "adenoma" containing cysts. She was quite well until the end of 1885, when she was admitted with three hardish tumours, one in the scar of the old operation, the others in the mammary substance. The whole breast was now excised. On examination, the breast was filled with cystic cavities, and the three tumours above spoken of were also filled with cysts, the tumour substance projecting into them. Unfortunately no microscopical examination was made.

In these cases we have disease as recurrent as any sarcoma. We can hardly believe that the operations were imperfectly performed, and can only explain the case by stating that the microscopical distinctions between some cases of fibro-adenoma and spindle-celled sarcoma have been very vague and untrustworthy, or that the disease attacks portions of mammary substance left after the primary operation.

As an instance of the association of carcinoma and adenoma the following is instructive:—

A tumour was excised by Hutchinson from the left breast of a patient, aged fifty-four, in the year 1873. She continued in good health until she was sixty-seven years of age. The tumour proved to be an encapsuled adenoma.

The patient's daughter had from girlhood a small, round tumour, the size of a cherry, which did not grow, beneath the skin of the left mamma. At the age of forty-four considerable increase of it occurred, and definite "scirrhus" formed around the original tumour, with affection of the axillary glands. The specimen shows a rounded adenoma projecting into the carcinoma. It can be seen in the museum of the Royal College of Surgeons.

Mr. Warrington Haward, in the *Lancet* for 19th May 1894, related a remarkable case where a fibro-adenoma apparently underwent cancerous degeneration. The tumour which showed the usual clinical characteristics, had remained in the mamma for nine years, when a nodule of hard carcinoma appeared in the skin over it. On removal of the breast and examination a typical cystic fibro-adenoma was found, and the carcinoma was developed in juxtaposition to it. It was the development of carcinoma near a fibro-adenoma, not in it. Such cases afford the strongest possible argument for the early removal of fibro-adenomata.

White gave an excellent description to the Pathological Society of London on 2nd February 1892 regarding a case of the late Mr. Marcus Beck. A woman of sixty-one had a typical scirrhus in the right breast, and an adenoma of the left. After removal, the right breast was also found to contain two adenomata in close proximity to the "scirrhus."

The association of adenomata and "scirrhus" in the same breast is referred to by several authors. It is probably quite accidental. There is a noteworthy reference and illustration of this condition in Hutchinson's smaller *Atlas of Clinical Surgery.*

The association of carcinoma and fibro-adenoma was also noted in Dr. Bramwell's remarkable case of general dissemination of cancer, and on p. 455 Mr. Stiles's remarks upon this association are quoted.

A specimen of mammary adeno-fibroma containing an adjacent piece of carcinoma was shown to the Pathological Society of London in 1881 by Mr. Rushton Parker.[1] The patient was a married woman aged forty-two, and the tumour had existed for three years.

A similar case is as follows:—

A married woman, aged fifty-four, had a lump the size of a small hen's egg in the right breast for thirty-four years. The tumour increased very little until three months ago, when, without ostensible cause, it suddenly enlarged. The nipple has always been stunted, and there has been marked retraction for the last three weeks. No family history of malignant disease. The patient was noted to be an obese woman of dark complexion with a moustache. In the right breast was a tumour the size of a fœtal head at birth. Portions of the swelling are soft and fluctuating, while others are hard. The mass is adherent to the reddened skin, but is movable on subjacent tissues. The nipple is retracted. The axillary glands are enlarged. Amputation of the mamma and removal of the axillary glands was carried out. The whole of the tumour was encapsuled, and it contained numerous cysts with proliferous intracystic growths. But at the sternal side of the tumour was an encapsuled mass the size of a tangerine orange, which appeared to be of more recent formation than the rest (carcinoma or sarcoma ?). There were extensive calcareous deposits in the septa. Rapid and fatal recurrence took place after the operation with general metastatic growths.

Finally, I am bound to confess that we need more knowledge regarding tumours of the breast which contain cysts and intracystic growths. They are far more prone to recur than the simple, hard fibro-adenomata. I have no doubt, in many such cases, if the whole of such tumours were examined by the light of modern pathology, proliferative changes in the epithelium and invasion of breast tissue would lead to the diagnosis of villous duct cancer. This appears to me to be a possible explanation of recurrence of tumours termed "cystic adenoma" by the older authors.

All such cases as just related, emphasise the importance of removing all tumours of the mamma of a benign nature on their detection. We never can be sure of what may happen to them as life advances if they are left untouched. The hard, movable fibro-adenoma of a young woman never recurs, though others may form in the same or the opposite breast. It is to this type of tumour alone that I regard definite prognosis as safe and reliable.

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[1] *Path. Soc. Trans.* vol. xxxii. p. 233.

CHAPTER VI

CYSTIC FORMATIONS IN THE BREAST NOT ORIGINATING IN PRE-EXISTING TUMOURS

Estimated frequency of simple cysts—Cases of cystic affections at St. George's Hospital—Simple cysts to be distinguished from cystic degenerations of tumours—Modes of formation of cysts in tumours—Complicated structure of some cysts—Goodhart's views—Cysts from duct obstruction—Alteration in size—Spontaneous disappearance—Illustrative cases—Papillomatous growths in simple cysts—Cysts from dilatation of connective-tissue spaces—Varied contents of mammary cysts—Diagnosis of cysts—Close similarity to solid tumours—The exploring syringe as a means of diagnosis and treatment—Operations for cysts—Cases in which the entire mamma needs removal—Summary of rules of treatment of mammary cysts—Illustrative cases of preceding remarks—Suppuration of cysts—Carcinoma of walls of cysts—Galactoceles—Treatment—Illustrative cases—Hydatids.

SINGLE cysts of the breast occurring independently of tumour formations are, so far as hospital records show, not common affections. Formerly under the title of sero-cystic disease many kinds of formations were included. Some of these tumours were cystic adenoma, others cystic sarcoma, not a few originated in the ducts, and would now be called cystic duct papilloma. Cases of mastitis with retention cysts also received this appellation. We have eighteen specimens of this somewhat mixed group at St. George's, and most other hospital museums contain them. Many of such tumours are of large size, and seem to be of historical rather than pathological interest, and a link connecting modern surgery to the past.

Williams,[1] in an analysis of 2397 mammary tumours, asserts that only 2·6 per cent were cysts. He quotes the researches of Gurlt at the Vienna Hospitals, who found only five cysts out of 1608 mammary tumours. The cases at St. George's Hospital show only twelve cases of single cysts in a period of thirty years. It must be remembered that many simple cysts are never treated at all, the owners not noticing them or bearing them concealed. Many are dealt with in out-patient practice. For instance, in the years 1896-1897, I treated five cases of simple cysts in the out-patient department of St. George's Hospital. I. therefore, personally believe that mammary cysts are far more common than some authors state, or than hospital records would lead us to believe. The proportion of these cases given above is probably considerably below the mark. The following table well exemplifies the comparative frequency of cystic affections:—In 66 cases studied by me from the records of St. George's Hospital, 34 belonged to the group of cystic sarcomata or cystic adenomata; 29 of these patients were over forty years of age; in 2 cases the cysts were carcinomatous; in 12 they were simple single serous cysts, varying in size from a walnut to a hen's egg. All these patients were over the age of forty.

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[1] *Brit. Med. Journ.* 25th January 1896.

There were two cases of galactocele, one of sebaceous cyst, and fifteen of multiple cystic disease with mastitis. In these latter amputation was performed designedly, or because carcinoma had been diagnosed. All the fifteen cases were between forty and sixty years of age.

In dealing with the important subject of cysts in the breast, the reader will do well to clearly appreciate the fact, that cysts may form an important and integral part of such new growths of the mammary gland, as fibro-adenoma, sarcoma, and any variety of carcinoma, especially duct cancer. It is true that these formations are found more commonly in some forms of tumour than others. I have seldom examined a soft malignant growth of the mamma, whether cancer or sarcoma, without finding cystic cavities on the cut surfaces. These may be of huge size, and in sarcoma may quite overshadow the original solid growth. The same is especially the case with many specimens of fibro-adenoma, and when the cysts are of appreciable size or number, the well-known appellations of cystic adenoma, cystic adenocele, and the like have been employed by pathologists and surgeons. In treating of each form of tumour, mention is made of cystic degeneration in connection with them.

Cysts in connection with tumours are, however, but parts of the tumour affection. The importance of the malady lies not in the cyst, but the tumour growth, and the treatment of cystic formations in connection with morbid growths is not that of the cysts, but of the tumours combined with them, and in the substance of which they originate. This consideration is obvious, yet it is extraordinary how difficult it may be to apply in practice. The cyst may increase to such a size as almost to obscure the remains of the tumour in which it really originated. A good illustration of this is seen in a specimen at the College of Surgeons Museum, where a cyst as large as a cocoa-nut has formed within a solid tumour, fibro-adenoma (?), and almost obscured it. This specimen is of interest also, as showing the formation of secondary intracystic growths in a cyst within a tumour. The specimen (4776 A) is also worthy of mention, as illustrating cystic formation of large size within a tumour.

No one but those who have to deliver authoritative opinions upon tumours of the breast, afterwards to be verified or falsified by minute examination, can appreciate the difficulty of deciding whether a given case of mammary cyst has arisen *de novo*, or whether it has not originated in a morbid growth which surrounds its walls or sprouts into its cavity. As this question is fraught with great and vital importance, it will be again alluded to in the remarks on treatment.

The cases considered in this article will be those of cysts of the breast independent of solid growths, which originate *de novo*. The interior of cysts which form in tumours is smooth and fibrous, or more often formed of disintegrating growth, whereas the interior of retention cysts, resulting from duct obstruction, is lined with flattened cells, which have a marked tendency towards proliferation and papillomatous formations.

Cysts, as is well known, may have abundant shaggy papillary growths upon their walls, and these may be so numerous as to almost fill the cavity; and then the confusion between such cysts and cavities originating in solid growths is very great, and almost unavoidable by simple naked-eye examination.

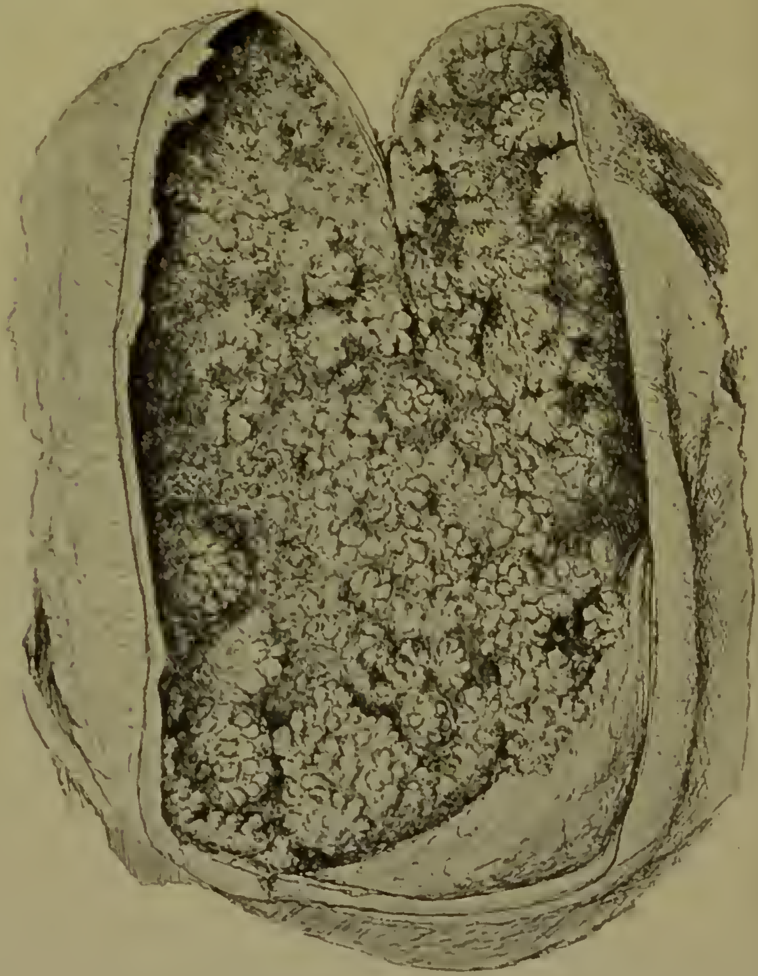

FIG. 29.—A huge mammary cyst, bearing complicated shaggy growths of a papillomatous nature upon its walls. From a specimen in the museum of St. George's Hospital.

It has been well pointed out by Goodhart,[1] also, that very diverse formations may occur by the junction and fusion of papillary intracystic growths. The cavities formed by the juncture of papilliform masses of epithelium endowed with secreting properties may, according to Goodhart, have these terminations. "(1) If the cavity be small, the gland-cells may join across between the opposing surfaces, and form to all intents and purposes a gland acinus. Such a process being universal would cause the fusion and solidity of intracystic growth just now mentioned. (2) If the cavity be of fair size, papillæ of epithelium may again form in the interior of the secondary cyst on the type of its own formation, and thus give rise to fresh follicular pits and cysts, within the substance of an intracystic growth. (3) The epithelium may become fatty and disintegrated, and pass simply off into the interior, assisting to form the mucoid fluid so common in this class of tumours."

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[1] *Ed. Med. Journal*, May 1872.

In the same way this author ingeniously points out that a cyst of good size, formed by the fusion of papillæ, may become "pouched inwards" at various places towards its own cavity, by pressure of other growths and cysts outside it. In this way many secondary follicles are formed within a single cyst, by the coalition of ingrowing opposite walls and angles. All these follicles are of course lined with active epithelium, and continue to increase and grow. The complicated and intricate structure of intracystic growths may thus be readily understood, for numerous processes are at work tending towards the same results, but in varying proportions and degrees, and the difficulty of accurately determining whether such a tumour be truly cancerous or not is readily appreciated.

Cysts from Duct Obstruction.—When we consider the multitude of ducts in the gland, their sinuous course, the numerous occurrences of inflammatory attacks from congestions or slight injuries, and the increase of fibrous tissue in the breast, from inflammatory causes, during the process of involution, and towards the close of life, we can easily understand that cysts are common from duct obstruction. I firmly believe that, if the mammary glands of women over fifty were examined through the microscope, minute cystic formations of the size of a small pea or hemp seed would be very commonly found. I have repeatedly found tiny cysts in operating upon cases of carcinoma, situated at a distance from the primary growth, and they are only thought to be rare, because they are not often large enough to be felt or become apparent.

The name of "involution cysts" is not uncommonly applied to cysts forming in the mamma, during the normal process of involution, and Gross speaks of cysts occurring in the active mammæ of young women, as evolution cysts. One can hardly doubt that such cysts arise from the obstruction of minute ducts, from chronic thickening of their walls, or from the pressure of fibrous tissue externally. In cases of chronic mastitis, where the toughened areas of inflammatory induration are numerous and obvious to palpation, cysts of various sizes are so common as to form an integral part of the malady, and are almost invariably found. I am of opinion that a far more important part is taken in the formation of mammary duct-cysts, by the obstruction in the ducts caused by papillomatous growths, than is generally believed, or has been hitherto taught. The number of duct-cysts which have papillary projections upon the walls is very striking. Every stage may easily be traced from the commencement of a duct-growth to cystic dilatation.

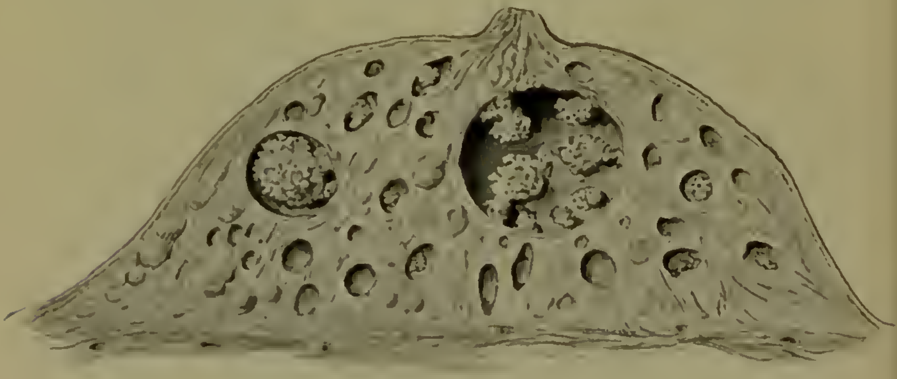

FIG. 30.—Duct-papilloma of the mamma. Numerous cysts exist full of intracystic growths.

Simple serous cysts from duct obstruction may be single or multiple, and found in one or both breasts. The walls are lined with flattened or columnar epithelium, and the contents are watery or straw-coloured serum. These formations vary in size from microscopical dimensions to a pigeon's egg or an orange. I do not deny that many attain to huge dimensions, but I am sure that it is quite exceptional for a very large cyst of the breast to manifest itself, unless it has originated within some new growth. There is a specimen in the museum of St. George's Hospital, however, where a single large cyst held no less than a pint and a half of reddish fluid. It contained intracystic growths, said to be fibrous. This great cyst had existed for seven years in the mamma of a woman aged fifty-two.[1] Most of the simple serous cysts I have examined have been the size of a nut or, at the most, a small orange. Occasionally the obstruction in the duct seems to yield, and an escape of yellowish or brownish fluid takes place from the nipple. The cyst again fills, to be again emptied by the same process, and firm pressure upon such a mammary cyst, may readily cause some exudation from the nipple. Indeed, cysts have been dissected in which a bristle can be passed from one of the main ducts into the interior. The size of duct-cysts will largely depend upon the calibre of the duct affected; commonly one of the small branch ducts is

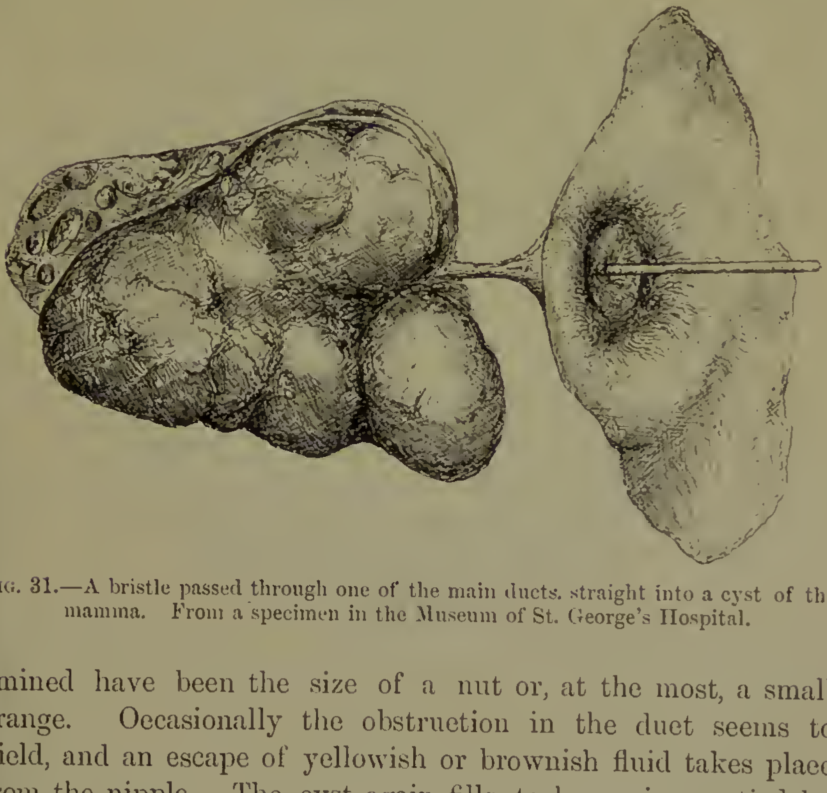

FIG. 31.—A bristle passed through one of the main ducts, straight into a cyst of the mamma. From a specimen in the Museum of St. George's Hospital.

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[1] St. George's Hospital Museum, 7 D.

obstructed, and then a small, tense, lobulated cyst arises. If the cyst arises in a main duct, and secretion is excessive, there is no limit to the size, but such large cysts are very rare. The irritation of the epithelium, in the case of obstruction to a duct, must be taken into account in the rapid secretion that occurs. The cells also undergo fatty and mucoid change, while the fact that some of these cysts communicate with ducts, explains a curious and rare phenomenon in connection with them, namely, their spontaneous disappearance. After disappearing they may refill, and again become manifest. Sudden alterations in volume of a tumour of the breast is always a sign of cystic formation. If a tumour be hard and round one day, and the next flaccid and soft, it will certainly prove to be a cyst. The following two cases of spontaneous disappearance are from Bryant's excellent paper in vol. xix. of the *Medical Society's Transactions*:—

> "A woman, about forty years of age, consulted me for a tumour occupying an outstanding lobe of her right breast, which had been taken by one surgeon to be an adenoma, and by a second as a carcinoma, but these views had been given some months before I saw her. On examination of the breast I found a tense, elastic tumour in the gland, which I diagnosed as a cyst, and as the patient's general condition was bad, I saw no occasion to lay the cyst open. Some months passed under treatment, tonics, etc., being administered, and as the general health improved, the tumour diminished, so that in six months it had disappeared. Six months later the woman was still well."
>
> "A woman, aged forty-eight years, consulted me in December 1893 for a lump in the centre of her right breast, which had been enlarging for months, and which had been pronounced to be a carcinoma. She was a married but childless woman, and was under the care of a physician for some simple uterine trouble. On a careful examination with the patient flat on her back, fluctuation was to be detected in the tumour, which was about the size of a Tangerine orange. The patient was highly neurotic and complained of severe pain. Six months later the tumour was larger. For the uterine trouble she was sent abroad, and when she returned, six months later, the tumour was swollen. In another three months it had disappeared, the disappearance of the tumour with that of the uterine affection going on together. She has now been well for a year (August 1895). This is the largest cyst in the breast which I have ever known to disappear entirely; whether it will reappear, and, if so, in an uncomplicated form, is a point for future observation."

In cysts which bear papillomatous growths of an innocent nature, it will be found that the epithelial cells, of which the flimsy dendritic processes are composed, do not penetrate the walls of the cyst and proliferate in the surrounding mammary tissue (Fig. 30). This point of vital importance in the treatment, and prognosis can unfortunately often only be definitely settled with the microscope, and the task is then by no means easy. It is asserted by many authorities that normal breast-tissue

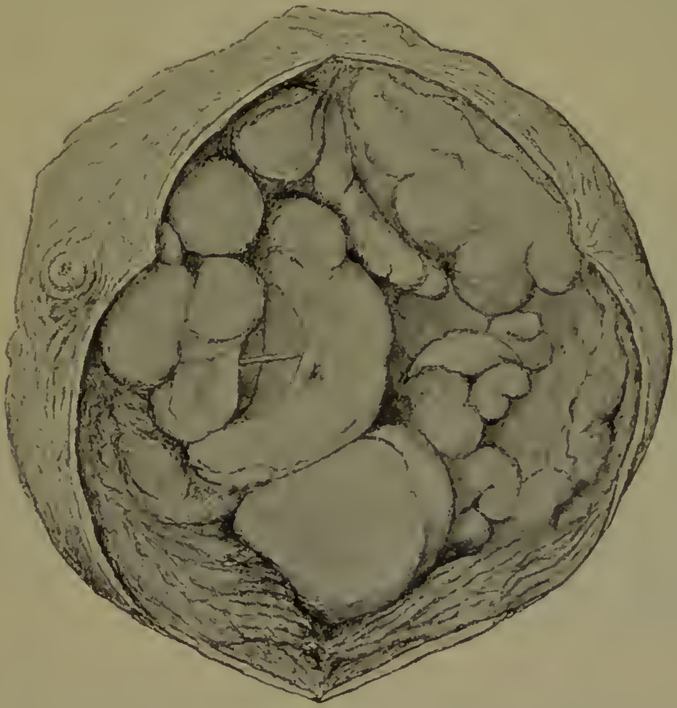

FIG. 32.—A cyst of great size containing growths of a fibro-glandular structure. From a specimen in the Museum of St. George's Hospital.

may project (fungate) into cysts. I have never been able definitely to make out this condition, though I do not deny its possibility, and regard such cases as cysts which have formed in fibro-adenomatous tumours, the new growth in the cyst-wall, not the breast-tissue, secondarily sprouting into the cavity. The presence of soft intracystic growths commonly leads to hæmorrhage, especially after handling. Consequently, simple serous cysts of the breast may suddenly enlarge and become painful, causing serious alarm to the patient, and too often, on account of their rapid increase and hardness, misleading the surgeon in his diagnosis.

The escape from the nipple of blood-stained fluid, or the withdrawal of the same from a cyst by a syringe, is fairly diagnostic of the presence of intracystic growth. The same may be said concerning fluids of various colours—green, black, or brown, which are commonly due to altered blood. Hæmatin and cholesterine crystals may be also abundantly found. In fact, it may be said that if a cyst of the breast contain highly-coloured fluids, it is seldom quite "simple" in nature, and this is a most important consideration for treatment.

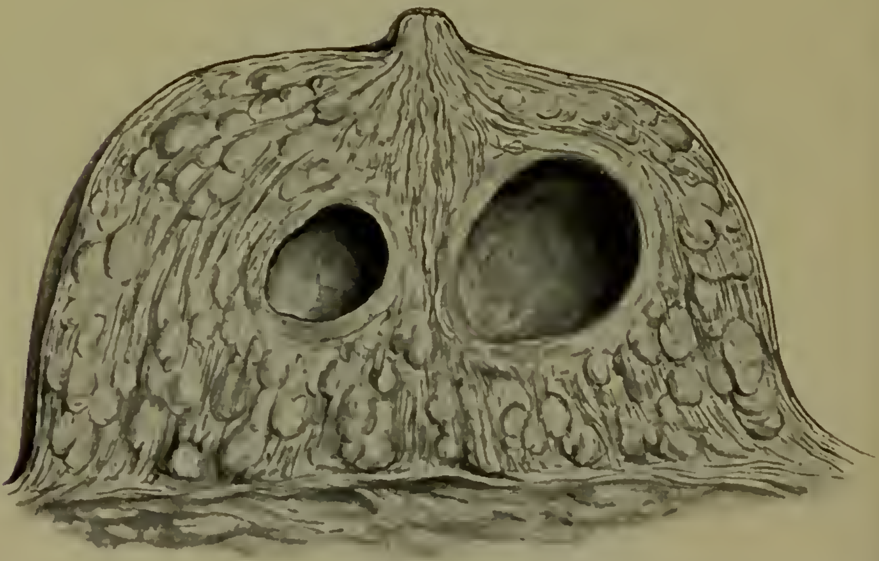

FIG. 33.—Two cysts deep in the mamma surrounded by indurated tissue. The breast was removed in mistake for carcinoma. The exact origin of the cysts was dubious.

Cysts arising from Dilatation of Connective-tissue Spaces.—These formations are common in chronic inflammatory affections; they may be single or multiple, but are seldom of large size. The walls are thick, the interior of the cyst smooth and fibrous. The contents are usually albuminous, clear, or straw-coloured serum. When deep in the breast and surrounded by indurated tissue, these cysts are only too likely to be mistaken for cancer, and amputation of the entire breast has been erroneously performed in their treatment more often than is allowed. It may be remarked, that it is exceedingly difficult to prove the origin of these cysts, and personally I would not pretend, even with the microscope, to say whether a given cyst the size of a hazel nut originated in an obstructed duct, or by dilatation of connective tissue spaces. Probably in a case of multiple cysts examples of both processes may be found.

It is easy to understand that, so variable are the contents of cysts of the breast, no useful classification of them could be made on these grounds. For this reason I do not make a special class of sanguineous cysts. Coloured fluids of various kinds are due to the admixture of altered blood with the contents of a serous cyst. Such blood may have its origin from the rupture of a newly-formed vessel in the wall of the cyst, from the bleeding of a papillary growth, or from hæmorrhage due to injury. In sarcomatous tumours blood-cysts are common. Again, after a blow upon the mamma, large hæmatomata may form. These usually slowly disappear, or may lay the foundation for a cyst containing altered blood. I have, however, never found in the breast such sanguineous cysts as one meets with, for instance, in the thyroid gland, where pure blood is being actively effused into a cyst cavity. Again, it must be clearly pointed out that cysts within carcinomata and sarcomata may contain clear and albuminous fluid. This is especially the case in carcinomatous cysts spoken of in chapter ix.

Diagnosis.—The diagnosis of cysts of the breast is a matter of the utmost importance, and the serious error of removing the entire mamma for a simple cyst is perhaps still too often committed. Gross makes the significant and important statement that the deeply-seated small cysts which occur after the menopause are, in the majority of instances, only discovered after the removal of the organ under the supposition that the disease was carcinoma. The similarity between cysts and solid growth is often striking. The walls of a cyst may be thick, and when the cavity is tightly distended by fluid, solidity is closely simulated. I have, for instance, observed the greatest difficulty in making students appreciate that a tightly-distended hydrocele simulates closely a solid growth of the testicle, and the practical rule remains, that a hard and deeply-seated lump in the breast of a woman may be a cyst, and the fact is only to be cleared up by exploration.

With multiple cysts the diagnosis is more easy, unless where these are associated with chronic mastitis, then the similarity to cancer is close. Little tumours varying in size from a grape to a Tangerine orange are scattered through the breast, associated with areas of indurated tissue, and pressure upon them will sometimes cause fluid to exude from the nipple. In cases of multiple cysts one or two are usually considerably larger than the rest, and unless the surgeon makes a careful examination, he is apt to overlook the smaller formations. "The first perceptible indication of the disease," writes Sir Benjamin Brodie, "is a globular tumour embedded in the glandular structure of the breast, and to a certain extent movable under the skin. Sometimes there is only one such tumour, at other times there are two or three, or many more. The examination of the breast in the living person does not enable you to determine the exact number which exists, as it is only when they have attained a certain magnitude that they are perceptible through the skin. In most instances the disease is confined to one breast, though it is by no means very uncommon for both breasts to be similarly affected." Here Sir Benjamin is probably alluding to that group of cases which we should now term chronic mastitis with cysts.

The exudation of fluid from the nipple on pressure is one of the most important signs of cyst, but it may be quite absent. The following observations as to the diagnosis between a lump of hard cancer in the breast and a cyst, will be found of much practical value. (1) The skin over a cyst is often tense, the venules may be enlarged, and a slight blue tinge is sometimes perceptible: but the integument never shows the "peau d'orange," or any marked adherence or definite dimpling. The only exception to this rule is as follows: If the cyst has been opened, or has spontaneously suppurated and burst, the after-healing and contraction may then simulate the adhesive processes over a cancer. (2) The nipple is not retracted. Should chronic mastitis coexist, retraction of the nipple may be manifest, and then the similarity to carcinoma will be all the greater. But the nipple is seldom, if ever, drawn progressively to the tumour, as is the case in cancer. (3) The axillary glands are unaffected, or if enlarged are merely engorged and tender. (4) Careful and firm palpation with the pulp of the index-finger will detect a sensation of yielding or elasticity towards the centre of the tumour. I look upon this as an important and reliable diagnostic sign. The size and tension of the tumour may vary on different occasions. There will yet remain cases in practice where doubt must exist, and these are only to be cleared up by exploratory incision. Those surgeons who appreciate the extraordinary similarity between cysts and solid growths, will have recourse to this judicious measure, and those who have the misplaced assurance, begotten of want of knowledge, will still commit the error of occasionally removing breasts which they ought to save, and of doing an extreme operation when a trivial

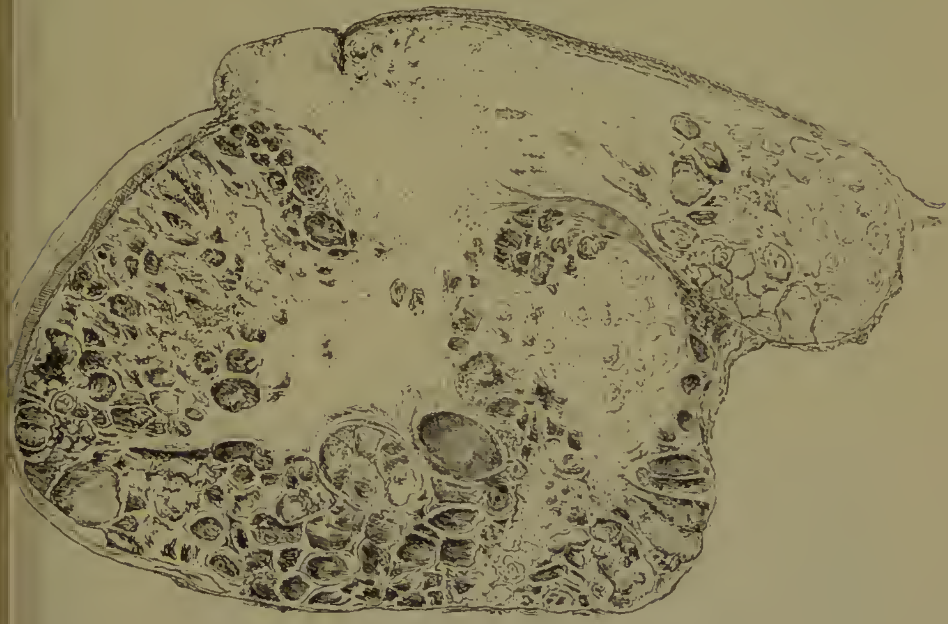

FIG. 34.—Chronic mastitis, the breast being riddled with hundreds of cysts. From a specimen in the Museum of St. George's Hospital.

one would have sufficed. The diagnosis of the all-important question of whether the cyst is simple, or associated with tumour growth, can generally only be settled by the exploratory incision. There is no objection to precede the incision by tapping with a scrupulously clean, exhausting syringe.[1] The needle should not be too fine, and the barrel of the instrument capable of containing about an ounce of fluid. If, after withdrawal of clear serous fluid, the cyst collapses and nothing solid can be made out, it is proper to assume that the case is one of simple cyst, and recourse may be had to injection. If, on the other hand, masses of solid growth are felt as the cyst collapses, or the fluid is highly coloured and mixed with blood, the diagnosis of intracystic growth may be made, and complete removal of the cyst advised. I would commend these diagnostic considerations very carefully to the reader. The simple cyst of the breast may be injected with equal parts of tinct. iodi. and water. Personally, in the few instances in which I have had recourse to this operation, acting on the insistence of patients, and their refusal to allow any cutting operation, I have injected half a drachm of a mixture of equal parts of liquefied carbolic acid and glycerine. The great objection to the injection treatment, is the uncertainty we must feel as to the exact nature of the cyst. If this be associated with intracystic growth, the injection treatment may not cure, and indeed is likely to aggravate the malady. Again, the injection may not sufficiently irritate the lining membrane of the cyst to ensure its obliteration. Accordingly, notwithstanding the favourable cases reported by Velpeau and others, I am much against this method, unless in perfectly evident cases of serous cysts, where it gives excellent results. Sir B. Brodie asserted that simple cysts would disappear by pressure and a stimulating embrocation.[2] Such measures are harmless, but doubtful in

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[1] I must here remark that I have known most serious consequences arise from using a syringe the piston of which is fouled by old putrid discharge. The needle is commonly boiled, and the piston or barrel left soaked in filth. Having seen patients suffer from sloughing and abscess from this blameworthy carelessness, I think right to mention it.

[2] Sir Benjamin's prescription was as follows :—Camphorated spirits, rectified spirits, of each three ounces ; liquor plumbi, one drachm ; a piece of lint wetted in this solution to be constantly applied to the skin. I have tried this remedy

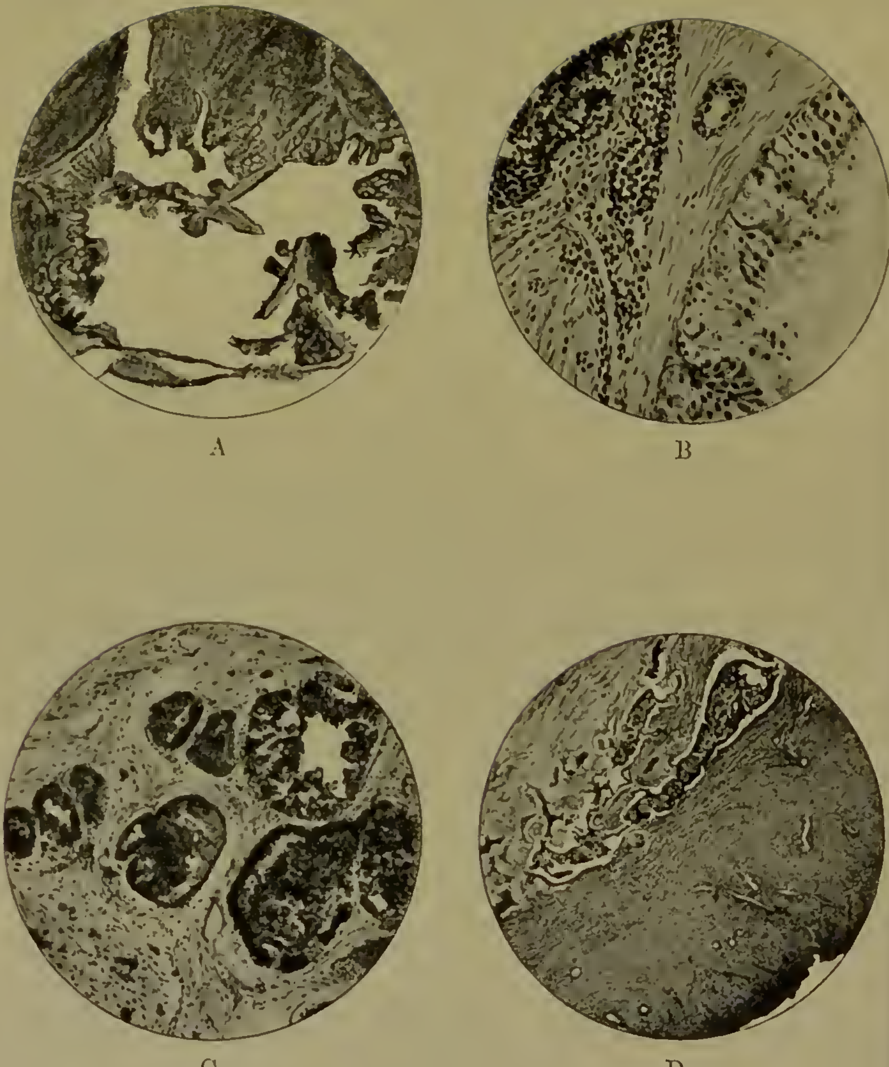

PLATE VIII.

A. A cyst of the mamma under a low power to show the flimsy dendritic papillary intracystic growth. B, A section of the wall of a simple cyst under a high power. The intracystic growths, seen on the right of the figure, project into the cyst, but do not infiltrate its walls. The cyst is therefore innocent in nature. C, Duct-papilloma under a low power, the cysts are full of intracystic growth confined to the interior of the cysts themselves. D, The wall of a true carcinomatous cyst as described on page 366. The masses of carcinomatous cells lie outside the granulation-tissue on the cyst wall.

To face page 235.

efficacy, and I should prefer the influence of repeated blistering.

When there exists a tendency towards the multiplication of cysts throughout the breast, I have little doubt that removal of the whole mamma is the proper course to pursue. Still more so is this the case in those instances where the whole gland is honeycombed with cystic cavities of all sizes, often containing papillary growths and filled with fluids of the most varying colour and consistency—clear, straw-coloured, green, mucoid, and glairy, brown or nearly black, or sanguineous from recent hæmorrhages. Rarely the contents are purulent. Cases like these are analogous to general cystic disease of the kidneys, and in both cases the true explanation of the tendency to morbid obstruction and dilatation of the ducts which obviously exists has, in my opinion, never yet been given.

In cases of multiple cyst I have several times removed portions of the breast containing the cysts with success. There is always a risk of fresh cysts originating in the remaining mammary substance, and the more radical operation, which should have been performed at first, has ultimately to be undertaken, for it is very common for one of the large cysts in the breast, to be associated with smaller ones, which may readily escape unobserved. After the operation, to the alarm of the patient, these enlarge and become manifest. In cases of cysts associated with papillary growth in the walls, I feel sure that the whole cyst, with the portion of mammary tissue about it, should be cut out. The more the growth is limited to the interior of the cyst, the closer the dissection may be carried to the exterior of the cyst wall. Should, however, the growth obviously infiltrate the breast substance round the cyst, removal of the entire breast should be carried out, especially in a woman over forty years of age. The more rapid and extensive the growth, the greater the reason for this step. It is exceedingly difficult, as I have pointed out, to be always sure whether papillary intracystic growths are transgressing their limits and undergoing malignant proliferation or not, and in all such cases, even if one or two vegetations only occur, I would always

in several cases of breast-cysts without any manifest results, but I have seen it efficacious in hydrocele of the cord.

counsel that the whole cyst should be removed by dissection. If the intracystic growth is very abundant, and the walls of the cyst thickened and juicy, as though infiltrated by growth, removal of the entire breast is probably the right practice to pursue. Very different is the treatment which is efficacious in those simple single cysts, the contents of which are devoid of blood, and which completely collapse on puncture. These may be incised and their walls "swabbed over" with pure carbolic acid. The skin may then be united, and the cavity drained or stuffed with a narrow strip of iodoform gauze.[1]

It thus appears that we may draw up the following rules for the treatment of cystic growths in the breast. It is hoped they will prove of value for the guidance of the surgeon, in matters which are often of more than ordinary difficulty:—

(1) In cysts forming in tumours the whole breast needs removal, unless the affection be cystic formations in a fibro-adenoma of slow growth, which tumour pushes aside the mammary substance and does not infiltrate it.

(2) In multiple cystic disease, the choice of treatment is between treating by tapping or incision obvious cysts, as they from time to time occur and become prominent, or removing the entire mamma, and the latter course is probably the best to adopt, especially in women of advanced life. The same remark applies if the affection is bilateral. Cases related at the end of this chapter show the curious tendency for cysts to form in any portions of breast-tissues that are left.

(3) In cysts which bear intracystic growths, the choice lies between dissecting out the cyst, with a liberal margin of mammary tissue, and removal of the entire breast. The more abundant the growth, the more hæmorrhagic the fluid in the cyst, the more the surgeon suspects that the growth infiltrates the cyst wall, the more reason is there for the performance of the radical operation.

(4) Simple cysts unconnected with any form of growth may be dissected out, or opened and stuffed with gauze, or their interior swabbed with iodine or carbolic acid. The injection treatment is a little uncertain, but it is trivial, and may

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[1] A striking and interesting series of cases of this nature, well worth perusal, will be found in a paper by Bryant, in vol. xix. of the *Med. Soc. Trans.*

be employed at the patient's request. Cases suitable for this treatment require careful selection.

(5) In all cases of exploratory incision the choice of removal of the entire breast, or the cyst alone, should be left wholly in the hands of the surgeons; and their action should not be fettered by previous diagnostic dicta founded on information which, without exploratory incision, may be misleading and erroneous.

(6) The leading symptom of cyst, exudation of fluid from the nipple, is not always present. Blood-stained fluid indicates intracystic growth, and is generally an indication for very complete removal. The diagnosis of the exact nature of a cyst can hardly be made from observations founded on nipple discharges.

A perusal of the following cases will, it is hoped, illustrate more clearly some of the more practical points advanced in the preceding remarks. It may be allowed that the practice of surgeons differs widely, and the rule of removing the entire breast for all cysts in women over forty is very generally adopted. I feel sure that much discrimination and reflection is needed before taking this step, and I by no means believe that we have evidence to show that all simple cysts become cancerous as life advances.

In the year 1892 I saw a lady, aged fifty-two, with a small tumour the size of a walnut situated near the right nipple. It was movable, painless, bluish in colour, and so obviously a cyst that it was translucent, like a hydrocele. It apparently had a connection with the nipple, for on squeezing some drops of clear fluid escaped. I did not see this case again until May 1896, when the cyst having become painful and increased in size, she again saw me. The tumour was little larger, but it was tender and exceedingly hard. There was one gland to be felt in the axilla. On making an exploratory incision, bloody fluid shot forth with such violence as to bespatter the face of the operator, and the interior of the cyst was occupied by friable, papillomatous growth. I thought it wiser to remove the whole breast and the axillary glands.

Examination of the specimens showed that the walls of the cyst were thickened by granulation tissue, and that the papillary growths were largely fibrous in structure. In the remainder of the breast were numerous dilated ducts and small cysts, the size of a split shot, filled with dark-green, glutinous fluid. Removal of the entire breast was consequently amply justified, in consequence of the multiplicity of small cysts; yet the papillary formation within the larger cyst seemed innocent, and had not invaded its walls.

The following case illustrates the practice of removing the entire breast in multiple cystic disease:—

On 17th April 1896 my senior colleague, Mr. Haward, removed the breast from a single woman, aged thirty-two, for a tumour which was of nine months' growth, irregular and fluctuating, and associated with a bloody discharge from the nipple. The glands were not affected, the skin was free, the nipple was not retracted. On section after removal the growth consisted of one large cyst the size of a walnut, and many smaller ones. Hundreds were scattered through the gland. The large cyst had smooth walls and contained papillary intracystic growth. It was filled with remarkable fluid, which was of the colour of coffee grounds, exactly resembling the contents of an old hæmatocele. The smaller cysts were full of straw-coloured fluid. A microscopical examination of the intracystic growth by Dr. Rolleston showed that it consisted almost entirely of fibrous and connective tissue. The case was one of duct-cysts, with fibrous intracystic growths and hæmorrhage.

Had the main cyst only been dissected out in this case, the others would certainly have become prominent, and necessitated fresh operation.

Diffuse cystic disease attacks both breasts very frequently. A striking instance of this was shown at the Pathological Society's meeting on 7th March 1896 by Mr. H. B. Robinson. The right breast was removed in August 1894, the left in November 1894. In the right breast were multiple cysts, containing greenish mucoid fluid. There was chronic interstitial mastitis, and evidence of cancerous change, but no intracystic growths. The left breast was "riddled with cysts" and affected by chronic interstitial mastitis.

A married woman, aged forty, had a swelling about the size of a walnut close to the nipple, freely movable, hard, non-fluctuating. It was thought to be a fibroma, but was cut into, and a straw-coloured serum escaped. Other cysts were seen, and this led to the removal of the entire breast, which was found riddled with cysts. A similar tumour found afterwards in the other breast, which was found studded with small cysts, had to be removed.[1]

A single woman, aged forty-five, was admitted into St. George's Hospital on 13th March 1894. She was in good health, and had noticed a tumour in the upper part of the left breast for about three months. The tumour was small and movable, and not adherent to the skin or nipple. At consultation it was decided that the tumour was a cyst, or an adenoma. On operating, it was discovered that the swelling was a thin-walled cyst, containing clear fluid, and there were many other cysts scattered about throughout the mammary tissue. Accordingly, the whole gland was removed. It was literally honeycombed with cystic cavities.

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[1] Shepherd, *Montreal Med. Journ.* 1890, vol. xix. p. 292.

A healthy single woman, aged forty-nine, was admitted into St. George's Hospital on 26th June 1889 with a tumour of the right mamma, which she had only noticed for a few days. She had had no pain, and no discharge from the nipple. In the upper part of the gland was a round elastic swelling, giving the sensation of containing fluid. The skin was not involved, or the nipple retracted ; the axillary glands were not enlarged. A much smaller "lump" could be felt close to the large one. An incision was made into the larger cyst, and it contained clear serous fluid without intracystic growth. The main cyst was attempted to be dissected out, but in doing so numerous smaller cysts were cut across, and it was obvious the gland was full of them. The whole mamma was therefore removed, as it was quite impossible to dissect away all the cysts which showed themselves.

An exactly similar case to the above was operated upon by myself at St. George's Hospital on 9th January 1897. The patient was a woman aged fifty-two, and two small tumours could be felt in the left mamma, one near the nipple, the other near the axilla. On incision, these were found to be serous cysts. Others were discovered by the incisions. The whole mamma was removed, and found riddled with cystic cavities of all sizes containing glairy fluids.

The deceptive nature of cysts in the breast is well illustrated by the following case :—

A widow, aged forty-five, was admitted into a London hospital in August 1880. She had had abscess and necrosis of the bones of the left leg, otherwise had enjoyed good health. A fortnight before admission she noticed a swelling in the left breast, and was taken to Sir James Paget, who advised removal, but believed the disease was not cancerous. In the left breast below the nipple was situated a hard, indurated, roundish mass, the size of a hen's egg. It was movable and circumscribed, but the skin was thought to be adherent to it. The nipple was not retracted, and there were no enlarged glands in the axilla.

The whole breast was removed. On examining the parts after removal a cyst the size of a walnut was discovered, containing some yellowish serous fluid. The lining membrane was smooth and glistening. The breast tissue round was perfectly healthy. The cyst might obviously have been dealt with by simple incision, or by puncture.

An instance of deeply-seated cyst in which I nearly committed serious error is as follows. It is a striking instance of the diagnostic difficulty which surrounds these cases.

A married woman, aged thirty-five, came to the out-patient department of St. George's Hospital in October 1896, and showed in her left mamma, about 3 inches above the nipple, a rounded, smooth, movable hard tumour, the size of a small orange, which she had noticed for three months. It ached sometimes, was slightly tender; the skin, nipple, and axillary glands were all normal. No cause was ascertained for its occurrence, and there was no history of nipple discharge. All the students who examined believed it to be a typical fibro-adenoma, but I felt certain it was a cyst, because of a sense of elasticity developed towards its centre on firm pressure. On 10th October I made an exploratory incision. The tumour lay deep upon the pectoral fascia, and some depth of breast-tissue had to be divided to reach it. I cut into the swelling, and, to my surprise, found it solid, and moreover quite incorporated with the breast substance round, so that it could not be enucleated. I then passed the opinion that it was some kind of malignant growth, and was about to close the wound and advise removal of the entire breast, when I fortunately determined to enter the scalpel to the centre of the tumour. I did so, and a jet of fluid shot into my face. The swelling was a simple cyst. Its walls were nearly ⅛th inch in thickness. It contained some sero-pus, and had obviously undergone thickening from chronic inflammation. The cyst was evacuated, swabbed with carbolic acid, and drained. This instructive case bears its own moral. When one explores doubtful tumours of the breast, the incision must be carried deeply into their interior or error may arise.

In like manner, Verneuil removed from a woman, aged forty-four, the left breast, for a tumour thought to be cancerous. One enlarged gland was found in the axilla. Section showed four large cysts beneath the nipple, which compressed and displaced the gland tissue. The largest cyst was the size of an egg, the others of a nut. They contained fluids of different colours and consistence. There were numerous small cysts around them, of the size of a pea or less. The breast otherwise was that of a healthy adult. Under the microscope there was a general tendency to dilatation of the acini, the definitely cystic acini containing clear polyhedral and polymorphic cells.[1]

A woman, aged forty-seven, was admitted into St. George's Hospital in September 1890. She had borne a tumour in the left breast for an indefinite time. It was hard, and the nipple was deeply retracted. The skin over it was adherent. Mr. Haward made an exploratory incision, and found a small tense cyst full of turbid fluid. The cyst-wall was therefore dissected away, and the patient made a good recovery.

A woman, aged fifty, formed the subject of consultation at St. George's Hospital on Wednesday 29th January 1896. She was married, and had one child sixteen years ago, and had no trouble with the nipples or breasts on that occasion. Three months before admission she noticed a "lump" in the right breast. On examination the patient looks healthy. There is a movable, hard tumour deep in the breast, near the outer side of the nipple. It is rather tender and painful. There are no skin adhesions and no retraction of the nipple. The axillary glands are not affected. "The tumour," writes the registrar, "appears to be an adeno-fibroma, but a malignant focus may very possibly be present now."

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[1] Wright, *Medical Chronicle*, 1886, vol. iv. p. 233; *Le Progrès Médical*, March 1886.

On 1st February an exploratory incision was made, and this disclosed a thick-walled cyst, with sero-purulent contents and no intracystic growth. The whole breast was, however, removed, and one or two smaller cysts, the size of a small pea, were seen on section. Microscopical examination by Dr. Rolleston of the walls of the cyst showed connective tissue, and the breast substance round was thickened and fibrosed. There was no sign of cancerous or sarcomatous growth.

In December 1896 I saw a lady, aged fifty-two, who had just noticed accidentally a "lump" in the left mamma. This gave her no pain. There was one very striking point about her history. Twelve years before, she had been pronounced to be suffering from cancer of the cervix uteri by four eminent London experts, including the late Dr. Matthews Duncan, whose opinion on such a point was not likely to be inaccurate. The fœtor and discharge gradually, however, ceased, and the disease appeared to have quite passed away. The patient was well nourished and healthy-looking. In the upper part of the left breast, about 3 inches above a well-developed unaffected nipple, was a patch of hardness the size of a florin. It was not circumscribed, but irregular in outline, and felt to the touch exactly like inflammatory induration. There were no other symptoms, and the integument and opposite mamma were quite free. There was no history of previous inflammations or injuries to the breasts. Such was the case upon which a decision had to be made, as to the true nature of the malady. I advised (1) that the patch should be blistered ; (2) that mercurials and pressure should be employed ; (3) that the iodides should be administered internally ; (4) that, if in fourteen days, no marked alteration for the better should be observed, exploratory incision should at once be undertaken. In a fortnight's time the "lump" had somewhat diminished, was more movable, and felt like a cyst. On 10th January I operated, and found rather deep in the mammary substance a cyst the size of a walnut, lined by thick membrane, and containing glairy mucoid fluid. This was dissected out, and she made a rapid recovery.

A very similar case is the following :—

M. W., aged forty-six, a married woman, was admitted into St. George's Hospital on 28th August 1888. She had noticed a gradually increasing and painful swelling in the left breast for three months. The nipple was not retracted, the skin not implicated, and there were no enlarged axillary glands. Deep in the middle of the mamma was a hard, rounded, freely movable lump about the size of an orange. An exploratory incision was made by Mr. Pick. The supposed tumour turned out to be a cyst, with the walls tightly distended with serous fluid. The cyst-wall was therefore dissected out, and the breast saved.

As an instance of treatment by injection the following case may be quoted.

A married woman, aged thirty-seven, came to the out-patient department of St. George's Hospital in January 1897, with a hard, globular, movable, deeply-seated swelling of three months' duration in the right mamma. Four months previously a cyst had been treated by incision in the left breast, and it was surmised that the present swelling might be of the same nature. Under nitrous oxide gas, a fine syringe was introduced and three drachms of clear fluid were withdrawn. About one drachm of equal parts of liquefied carbolic acid and glycerine was thrown into the cyst, by means of the same needle through which the fluid had been extracted. This gave rise to no pain, there was slight after-inflammation, but the cyst was quite cured, and there was no mark upon the breast. Two similar cysts afterwards formed, and they were treated in the same way, with equally satisfactory results.

The wards of St. George's Hospital and other institutions afford sufficient examples of this nature, of deeply-seated and apparently solid tumours of the breast turning out to be cystic. It is useless to occupy space by relating more of these cases, which all point to the same moral, the prudence of exploratory incision or tapping in cases that admit of doubt.[1]

When cysts of the breast are much handled they inflame, and being surrounded by indurated and tender mammary tissue, their true nature and size are considerably obscured.

A girl, aged eighteen, was under Mr. Warrington Haward's care in St. George's Hospital in December 1894. She had a painful "tumour" in the axillary margin of the right breast, the size of a hen's egg, which she declared had only existed for six days. The girl has never menstruated, and she suffers much pain in the affected mamma every month. The swelling was red, inflamed, hard, and intensely tender, so that it was difficult to properly examine it. Lead and spirit lotion were applied, and the breast elevated with a sling. The pain and swelling gradually subsided, and in a fortnight all that was left was a small tumour the size of a walnut. This was removed by the house-surgeon, and I afterwards examined the specimen. It was a cyst, and its walls were incorporated with the breast-tissue round it. The contents were bloody fluid, and the small interior was nearly filled with dendritic growths from its walls.

A married woman, aged thirty-seven, was in St. George's Hospital in June 1896 with an ill-defined tumour in the upper part of the left breast. The swelling was indurated and tender, the skin hot and reddened. The mass gave one the idea of being inflammatory, but in the centre of it was an obvious rounded tumour, which was pronounced by some to be adenomatous in nature. Pressure and lotions were applied, and the whole mass gradually disappeared, but not entirely; there was still an ill-defined central swelling. The patient was again admitted on 8th August 1896. A tumour, prominent, tense, elastic, was now evident just above the nipple. An incision was made into this. It proved to be a large cyst with thick walls. The fluid was clear. There were no intracystic growths. The cyst wall was swabbed with pure carbolic acid, and the cavity drained. The patient shortly after passed under my care for treatment. Six months afterwards I wrote to, and inspected this patient, and there was no trace of return of the disease.

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[1] I much prefer the use of a fine exploring syringe to a grooved needle. The needle of the syringe should be somewhat larger, than that used for the ordinary hypodermic injection.

Simple cysts of the mamma may suppurate. No doubt organisms gain access to the cavities through the ducts, or after puncture with a septic needle or trocar.

A married woman, aged forty-seven, was shown at the consultations at St. George's Hospital in November 1895, with a peculiar swelling in the left breast. Her last child was born seven years ago. She had noticed the "lump" in the left breast for about six weeks. It had given her little pain. In the outer part of the left mamma was a soft fluctuating swelling about the size of a duck's egg. The nipple and skin were not affected, and the axillary glands were unimplicated. The diagnosis of cyst was generally agreed upon. My senior colleague, Mr. Turner, operated and informed me that thin pus was evacuated. The wall of the pus-containing cavity was, however, so definite and fibrous, that he had no doubt the case was really one of suppuration within a serous cyst.

A single woman, aged thirty-three, was admitted into St. George's Hospital under Mr. Pick's care in November 1889 suffering from a tumour of the left breast. She stated that this had existed for six weeks, but the history seemed doubtful. Her mother had died from cancer of the uterus. She has always had a painful and retracted nipple. On examination there was a large round, tender, movable swelling in the upper part of the left breast, the skin was non-adherent. There were some enlarged glands in the axilla. At a consultation, exploration was decided on. This being performed, pus was discovered, and the sac of the supposed abscess with the surrounding breast-tissue was dissected out. On further examination there were found several papillary growths on the supposed abscess wall, which showed that it really was a cyst undergoing suppuration. This swelling, on account of its pain and rapid increase, had been confidently diagnosed as cancerous by several observers.

The tendency to re-formation of cysts in portions of breast-tissue left by operation is illustrated by the following cases.

It is remarkable how long a period of time may elapse and yet fresh growth take place.

A married woman, aged forty-eight, was admitted into St. George's Hospital in March 1874. A year previously Mr. Hewett had removed the left breast for a tumour described as fibro-cystic. It was of slow growth, lobulated, and full of cysts containing coloured fluid. The recurrence was the size of a walnut, and situated in the skin. It was again removed and found to be of a cystic nature, without any trace of solid growth.

A case is related by Johnson[1] where recurrence took place in the scar of a cystic growth, (?) a cystic fibroma, which had been previously removed (about nine years before) by Marcus Beck. The recurrence is attributed to a fragment of breast-tissue having been left behind, which in studying the case seems a very probable explanation not only of this, but of other similar instances.

On p. 215 is related a remarkable instance of recurrence of a pure cystic growth.

In March 1898, a remarkable case of recurrence of a cystic growth in the scar was operated upon at St. George's Hospital. No less than twelve years before, the breast had been removed for that vague affection termed "tubero-cystic disease." The recurrent tumour was near the centre of the scar, the size of a pigeon's egg. It was composed of a congeries of cysts containing bloody fluid and papillomatous growth, which spread into the fat and connective tissue, and was obviously villous duct cancer. This significant case shows us: (1) the loose nomenclature of cystic affections of the mamma; (2) the tendency for duct-papilloma to degenerate into carcinoma, and to attack any tiny fragment of glandular tissue left; (3) the local nature of such recurrences; (4) the long period of dormancy or latency of the infective elements, whatever they may be.

Attention must be drawn in this chapter to the fact, that in rare instances carcinoma may invade the walls of simple cysts. These are not cysts developed in carcinoma, but carcinoma developed in pre-existing cysts. The cases are so few, and have been so recently fully recognised, that their true nature is a matter of conjecture. The importance of this condition is not so much the cyst, as the carcinoma in its walls, and the diagnosis is attended with so much doubt and difficulty, that I have thought best to discuss the subject with illustrative cases, in the chapter on the diagnosis of peculiar forms of carcinoma. The possibility of a large cyst in the breast of an elderly woman being of this nature, must never be lost sight of. The contents are colloidal or bloody fluids, and the walls are markedly thickened, like those of an old bursa or cut melon.

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[1] *Path. Soc. Trans.* vol. xliii.

The case here mentioned, will more clearly describe the peculiar relation sometimes existing between cysts and cancer.

A married woman, aged sixty-nine, was admitted into St. George's Hospital in October 1892 suffering from a tumour of the left breast, which she had noticed for a long period. She quite remembers that fourteen years before, she used to suffer from bleeding from the left nipple, which came on occasionally, and there has been an indistinct "lump" present for many years. During the last few months it has become larger and more painful. There was a softish semi-fluctuating tumour in the centre of the left breast. The nipple was retracted, the skin not dimpled, the axillary glands were a little enlarged. An exploratory incision was made by Mr. Haward, and a quantity of greenish pus escaped, coming, as he thought, from a suppurating cyst. A hard mass of carcinoma was however felt posteriorly, and apparently in juxtaposition to the cyst, and the whole breast was removed. Unfortunately no microscopical details of this very important case are preserved, but looking to the history, the inference is strong that this was a case of duct papillomatous cyst, which infiltrated the parts round, and subsequently became definitely carcinomatous.

GALACTOCELES

Pathology.—Cysts containing milk, or substances derived from milk, must be carefully differentiated from the localised engorgement and collections of milk which occur in the breasts of actively lactating women, when the function is suddenly interrupted. This appears to correspond to "galactocele by infiltration," spoken of by Velpeau, which I am disposed to thus explain.[1] A specimen illustrating dilatation of the tubes which are filled with milk, is preserved in the College of Surgeons' Museum from the Astley Cooper Collection (4741).

Judging from the analogy in the testis of seminal cysts, it is possible for a galactocele to form by the accidental rupture of a galactiferous duct, which is stretched over the wall of a pre-existing cyst, and this may explain some of those perplexing cases where collections of caseating milk have been found mixed with cancerous or other tumours.[1] For instance, a tumour removed by Birkett, weighing 3 lb. and called an "adenocele," contained a large cyst in which the ducts terminated, and this was full of cream and caseating material.[1] Far more commonly, however, the true origin of galactocele is to be sought in the obstruction of one of the larger ducts, during active sexual life, in young women, and especially during lactation. The cysts are usually single, and seldom attain a larger size than that of an orange or hen's egg. Scarpa relates an enormous galactocele, which contained nearly 10 lb. of fluid. Birkett evacuated a cyst of this nature, which contained 10 ounces. A significant number of these cases take their origin in injuries—blows upon the breast, or incisions for abscess near the nipple. The larger ducts become injured and subsequently obstructed. Malformation of the nipple is also a possible cause. One of the main ducts becomes obstructed, and milk being actively formed behind it, a cyst forms, which has the peculiarity of becoming larger and more painful with each advent of lactation. Some authors, as Birkett, state that the swelling increases in size during the act of suckling, and this was also long ago noticed by Sir A. Cooper.

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[1] Velpeau, *Diseases of the Breast*, p. 243.

The contents of galactoceles are very various. Thus one cyst may contain serous fluid, slightly turbid from the admixture with it of colostrum corpuscles. Another may present almost pure milk, while a third may show substance like butter, inspissated caseating material, and cholesterine. Gross collected seventeen cases, and found that the contents were pure milk in seven; of the nature of cream in two; oil in one. Partly curdy and partly fluid in one, semi-solid and caseous in five, and of the nature of butter in one.[2] The varying nature of the contents of these cystic formations is well seen by two specimens in the museum of St. Bartholomew's

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[1] *Old Catalogue*, Guy's Museum, 2299^{40}.

[2] Gross in *Tumours of the Mammary Gland*, p. 191.

Hospital.[1] In the one the contents of the cyst are exactly like cream, in the other the contents are so solid as to resemble tumour growth. The walls of the cyst are in very rare instances calcareous. . Old galactoceles with inspissated contents have been confounded with dermoid cysts, and also with carcinoma. Galactoceles of ancient date may shrink and diminish as the fluid parts of the contents become absorbed. It must be remembered that swellings of this nature may be found in the breasts of women many years after the lactating period. Such cases may readily be misinterpreted. Thus in the London Hospital Museum[2] is a galactocele the size of a broad bean. It contained curdy material, and being surrounded by much fibroid material was excised in mistake for scirrhus. A breast was also removed at Guy's from a middle-aged woman, but the supposed tumour was a cyst full of "cheesy" material.[3] Galactoceles, especially recent ones, may inflame; and, pus forming, they are transformed into the true milk-abscess of the older authors.

The engorgements of accessory mamma in the axillary region during lactation, must not be confounded with true galactoceles. Such swellings usually subside spontaneously.

Diagnosis.—The diagnosis of galactoceles rests on the history of their origin at the terms of pregnancy and lactation, and the possible enlargement of the swelling during lactation and suckling. This affection forms a smooth elastic swelling, the skin and nipple are unimplicated, and the superficial veins are often a little enlarged. A swelling having cystic characters forming quickly in the breast of a young parturient woman, especially in relation with a blow or other injury, is likely enough to be a galactocele. The exploring syringe, or an incision, can alone clear up the case. Galactoceles of old date, may be surrounded by indurated, inflammatory material, and the contents are often thick and caseous. Such swellings feel hard and lumpy, and may closely simulate solid growths, as carcinoma. Still a hint of the true nature of the case, may be afforded by a statement of the patient to the effect, that the swelling first appeared during lactation periods, perhaps many years before. An exploratory incision will do the rest. "Upon the whole, in the absence of exploratory puncture, the development of a swelling, without signs of inflammation, during lactation affords presumptive evidences of a milk-cyst" (Gross).

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[1] 3144, 3145.

[2] No. 2294.

[3] *Old Catalogue*, Guy's Museum, 2290^{50}.

Treatment.—I would advise in a case of galactocele, that operative measures be, if possible, postponed until the period of lactation is over, and the secretion of milk largely checked. All operations upon actively lactating breasts are unsatisfactory on account of the congestion and altering vascularity of the part, and its tendency to septic influences. Suppurating galactoceles should undoubtedly be treated like ordinary abscesses.

In cases when the contents are semi-serous, or very fluid, it is the ordinary practice to incise the cyst, and dress it from the bottom. I will not here refer to the more obsolete methods, as the application of the cautery, or of caustics, or the passage of a seton. It would seem generally better to dissect away the whole cyst, and this should certainly be done if the walls of it are thickened. A large cavity will then be left, which, as in the case of removal of an adenomatous tumour, will give great trouble unless elaborate care is taken with drainage and after-dressings. It is well, in dealing with mammary cavities left after operations deep in the breast, to approximate their walls by sutures of fishing-gut, passed very deeply, and to drain them by a full-sized tube brought out in as dependent a position as possible, and as near the junction of the mamma with the thorax as is feasible. The ordinary practice of bringing out the tube anteriorly or superiorly is essentially bad, as drainage cannot thus be properly effected, and collections of blood or serum are apt to accumulate. In cases where galactoceles are solid or semi-solid, the whole mass should be freely dissected away with the surrounding thickened tissue. Cases are not unknown of galactoceles occurring in connection with tumours of a malignant nature, the entrance of milk into the cysts of these being probably by extravasation.

The following cases will illustrate the fact that galactoceles have very diverse contents, and are of very varied consistence, and will show how vague and misleading some of the supposed guiding symptoms may prove.

Atlee of Philadelphia brought forward a specimen of solid galactocele resembling the concrete galactocele of Velpeau. The tumour was the size of a child's fist, of the consistence and appearance of hard putty. It had existed for three years in the breast of a lactating female, aged twenty-eight. Atlee looked upon the tumour as a mass of caseine, surrounded by condensed cellular tissue.[1]

A healthy-looking young married woman, aged eighteen, stated that two years ago she had struck her right breast against a chair, and three months after noticed a small lump near the nipple. She had been married fifteen months, and her first child was born about six months ago. Only a "little milk" came in the right breast, and she did not suckle with it. On examination, the left breast was noted to be well developed, with a good nipple, and secreting freely. The right gland was almost entirely occupied by a tense, rounded, fluctuating swelling, a little involuted mammary tissue being felt at the lower part. The nipple was flattened out by the swelling. The skin was not reddened, there was no enlargement of the axillary glands. A week later, the swelling was distinctly larger and pointing, the contained milk being visible as a white spot in the centre of a red area. A small incision radiating from the nipple evacuated about half a pint of creamy fluid, and the sac completely collapsed. A horse-hair drain was inserted, and the breast supported by a bandage. A thick milky discharge continued to flow from the wound, it got thinner and ultimately ceased. Microscopically, the fluid contained colostrum, oil globules, and fine granules. Mr. Pearce Gould, who treated the case, remarks that lacteal cysts are not common, and that a previous history of injury is sometimes noticed. In the present case, injury to the ducts probably led to the obliteration, and the formation of the cyst in consequence.[2]

A married woman, aged forty-two, noticed a small painful lump in the left breast six months before admission to University College Hospital. There was a nodular hard tumour, the size of a Barcelona nut, at the inner border of the left breast, freely movable in the gland. The nipple was normal, and there were no palpable axillary glands. This patient suffered also from floating kidney. The nodule was excised by a short incision radiating from the nipple, and a small operation was done upon the anus for hæmorrhoids at the same time. The wound healed by "first intention." The nodule from the breast consisted of a smooth-walled cyst, $\frac{1}{3}$ inch in diameter, containing a soft, cheesy substance. It was surrounded by fat and indurated breast-tissue.[3]

A very important specimen, entitled "Encysted fatty Concretions in a breast affected by Chronic Mastitis," was shown by Mr. Watkins-Pitchford at a meeting of the Pathological Society of London on 7th March 1896.

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[1] *Trans. Coll. Phys. Philadelphia*, 1873, iv. 465. [2] *Lancet*, 1880, vol. ii. p. 850.
[3] *University College Hospital Reports* for 1888.

A married woman, mother of ten children, was admitted to the Shropshire Infirmary in May 1894 for "lumps" of the left breast, which she had noticed twelve months ago while suckling her youngest child. In the lower part of the organ were two or three wedge-shaped masses of indurated tissue. Embedded in these were three or four hard nodules. Retraction of the nipple was produced by traction upon them. The breast was removed, and the axilla cleared out as though for cancer. On examination, however, the breast was affected with chronic mastitis, with numerous minute cysts containing milk in various stages of inspissation. Embedded in the gland were several round "cheesy" nodules. The exhibitor explained these curious formations as the results of filling of the ducts obstructed by mastitis with milk. The more solid parts of the milk were retained, while the fluid drained away through the lymphatics. In the discussion, Targett mentioned a similar case in which the cheesy concretions were the size of hazel-nuts, and fell out of the cysts in which they had formed. Shattock regarded these inspissated masses as nothing but "human butter." It is thus seen that galactoceles may be multiple, and a specimen which shows this well is to be seen in the museum of St. Thomas's Hospital (2512, Series 48).

A married woman, aged thirty-six, the mother of six children, was treated by a colleague, at St. George's Hospital, in November 1886, for a tumour of the right breast, which had existed for nearly five years. She stated that a swelling came in the breast after her fifth confinement and rapidly increased. It afterwards somewhat subsided under lotions. During the last two years the tumour had not increased in size, and it gave but little pain. In the upper part of the right breast was a round, hard, globular swelling, which moves freely on the subjacent tissues, and was not adherent to the skin. The nipple was not affected, there was no discharge from it, the axillary glands were free. No fluctuation could be detected. The tumour was exposed by an exploratory incision, and proved to be a galactocele, with thick yellow inspissated contents. The whole cyst was dissected out with satisfactory results.

The rapid origin of this tumour in connection with pregnancy and lactation is very characteristic of the affection we are considering.

A married woman, aged thirty-four, was admitted into St. George's Hospital on 8th April 1884 under the care of Mr. Pick. She had a child nine months before admission, and nursed it until fourteen days ago. She states that she has had a small "lump" in the breast for twelve months, which has steadily increased and given her much pain. The swelling was punctured in the out-patient department, and milk was discovered. The woman was noted to be of healthy appearance, the nipple not retracted, the axillary glands slightly enlarged. In the upper part of the breast was a deeply-seated elastic swelling, ill-defined, giving the sensation of fluctuation. The house-surgeon again tapped this, drew off a "thick white fluid," and applied pressure and strapping. The patient appears to have been cured.

A married woman, aged twenty-four, mother of two children, had severe inflammation of both mammæ after the second confinement. Two months after, a tumour was noticed in the left breast, about the size of a small orange, freely movable, and of a soft doughy feel. It was dissected out, and a cyst with thick walls, containing a putty-like material, was demonstrated. It was a galactocele, from which the serous portion of the milk had been slowly absorbed.[1]

The following case strikingly illustrates the great length of time galactoceles may remain in the breast, enlarging by fits and starts, and the doubt that must ever hang round the diagnosis of such tumours:—

A widow, aged forty, was admitted into St. George's Hospital in February 1888, with a tumour of the left breast, of which she gave a remarkable history. It had existed for at least eighteen years, and had originated during her period of active married life, during which she had seven children. Fourteen years before, the swelling became larger, and in the last six months it has rapidly increased. The case was shown in consultation, and it was noted that the swelling was obviously cystic, movable, painless, not attended with enlarged glands, with retracted nipple, and dimpled skin. No one could give a positive opinion as to its nature. On exploratory incision a large quantity of grumous material, exactly resembling "thick gooseberry fool," was evacuated. Portions of the cyst-wall were examined by Professor Delépine, and he was inclined to the belief that the cyst was either an old galactocele or a dermoid cyst. As the tumour was deep in the breast, and "dermoids" are here very rare, I incline to the former opinion.

The following most instructive case, well illustrates the association of a galactocele with a solid tumour. It seems likely that a fibro-adenoma with cysts first formed, that then the patient became pregnant, and that during lactation milk escaped into the cysts which reached an enormous size:—

A married woman, aged twenty-four, had noticed a tumour of the left mamma for eight years, for the last two years she had been lactating. The tumour was mainly below the nipple, and was of huge size. It measured 26 inches in circumference, and weighed, after removal, 11 pounds. The breast was left uninjured. On section, there was a large cyst containing two pints of "cream," and a secondary cyst, like a knob, projected into the larger, and was filled with "firm cheese." The walls of the cyst were thick and succulent, and obviously, from the account, of fibro-adenomatous structure.[1]

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[1] Shepherd, *Montreal Medical Journal*, 1891, vol. xix. p. 292.

The following case illustrates the rare phenomenon of multiple galactocele :—[2]

A healthy married lady had been the subject of a "right mammary tumour" for eight years, which had its origin in a blow on the part. It had become suddenly painful, with greatly increased size and pyrexia at the birth of the third child. The infant was not suckled by the affected gland. The tumour, which was lobulated, fluctuating in some parts, solid in others, was removed by Birkett. He found the growth to consist of one large cyst, and a number of small ones, which mostly communicated with the large cavity. The cysts contained no less than a quart of fluid, composed of milk and the ordinary serous secretion of the cysts. In discussing the pathology of this most interesting case, Birkett inclines to the belief that the milk was secreted by the adenoid growth projecting into the cysts. The sudden enlargement and pain are more suggestive to my mind of an accidental rupture of a large milk-duct into one of the cysts, as happens so commonly in spermatoceles. This case I have before referred to, in discussing the question of the possibility of milk being secreted by the epithelium in adenomatous tumours.

Solid galactoceles may simulate fibro-adenomata.

An unmarried girl, twenty-one years of age, was admitted into St. George's Hospital in January 1891. For three months she had noticed a "lump" in the left breast. There was no apparent cause for its occurrence. It has increased in size, and is at times painful. The opinion was expressed that the growth was an adenoma, for it was described as nodular and movable on the deeper parts. The nipple was not retracted, there was no discharge from it, and the glands were free. On exploratory incision the supposed tumour turned out to be a cyst. It was full of thick, curdy material, either a galactocele or a sebaceous cyst. It was treated successfully by dissecting away the wall of the cyst.

Gross[3] also draws attention to the fact that an inspissated galactocele can scarcely be distinguished from a solid tumour. He quotes the case of a lady aged twenty-four, in whom a round, nodulated, firm, painless tumour, the size of a hickory nut, had existed for sixteen months just internal to the areola. It rolled about under the fingers. A significant fact regarding this case was its development two weeks after parturition. Gross was not certain of its nature until an exploratory incision gave vent to curdy contents. He points out that solid galactoceles may diminish in size, and even retain the impressions of the firmly-pressed finger upon them, like putty or a fæcal tumour; this diagnostic sign is worthy of careful remembrance.

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[1] Le Gros-Clark, *Trans. Med.-Chir. Soc.* vol. lvii.

[2] *Path. Soc. Trans.* vol. ix.

[3] *Tumours of Mammary Gland*, p. 194.

A case where a breast was unfortunately removed for a single galactocele by retention will be found reported in the *Annals of Surgery* for 1888. The patient was under the care of Bogoliiboff in Russia, and the tumour was as large as a goose's egg, hard and deeply embedded in the centre of an enlarged mamma. It was pronounced to be a sarcomatous growth, and the whole mamma was excised, when the unfortunate diagnostic error was made apparent.

Other notable cases of galactocele are those of Astley Cooper, Stanley, Dupuytren, Forget, and South in his *Chelius*. Velpeau relates in his work a remarkable case where a solid or concrete galactocele attained to the size of the two fists. Curiously enough, after incision, the wound appeared to take on malignant action, and Velpeau found himself in "extreme perplexity" regarding it. Some masses of tissue fungated into the wound, but these, on examination, resembled "Dutch cheese"; and it seems likely, reading this case by modern lights, that the appearances were due to septic granulation tissue, mixed with caseating masses.

The following case is an additional illustration that tumours of the nature of galactoceles may be multiple, and found in unmarried women:—

A single woman, aged twenty-six, came to the out-patient department of St. George's Hospital on 27th February 1895, presenting two small tumours of the left mamma. In January a fatty tumour had been removed from the left side of the abdominal wall. The tumours of the breast had only been noticed for a month. They were situated in the axillary margin of the left mamma. The larger was the size of a hazel-nut, the smaller of a large pea. They were both hard, movable, and slightly tender. I pronounced them to be fibro-adenomata. The little tumours were easily removed under ether. On cutting them across, to my surprise, the contents were exceedingly soft and pultaceous, like those of a sebaceous cyst. Their depth in the breast-tissue negatived this possibility. Under the microscope, the contents of the little cysts were amorphous débris, fat, and oil globules. The capsule was very thick and fibrous, and lined by endothelium. The opinion I formed of the origin of these curious cysts was as follows: Obstruction of ducts, secretion of fluid, absorption of the more fluid parts, with inspissation of the residue. Though not perhaps true galactoceles, these cysts were closely analogous to them.

A young woman of good health, aged twenty-eight, had a child when she was twenty-one, which she nursed. Since this time she carried in the neighbourhood of the nipple a hard tumour of the size of a mandarin orange. Divers physicians who had examined the case thought she was affected by cancer. M. Reclus was called to see her, and though confirming the symptoms which had allowed of the statement of malignancy, notably the existence of enlarged axillary glands, he was struck with the peculiarity, that the tumour remained absolutely round, and that its surface was, as it were, covered with protuberances or lobules of the mammary gland. This decided M. Reclus to make an exploratory puncture with Anel's syringe, and a milky fluid was withdrawn, which was examined by M. Leon, the "interne," and found to be composed of colostrum. Some days afterwards M. Reclus aspirated, and filled the cyst with an emulsion of iodoform, a cure ultimately resulting.[1]

A careful perusal and consideration of the above cases will show the surgeon the principal points in the diagnosis and treatment of a class of cystic swellings which are, after all, exceptional. He will also gather that the value of exploratory incisions is here very great. A most elaborate paper on this subject, where a number of cases are quoted, and much stress is laid upon diagnostic considerations, is written by Forget.[2] It is well worth attentive perusal.

Hydatids.—The rarity of hydatid cysts of the mamma may be judged from the fact that not a single case was admitted to St. George's Hospital in a period of thirty-five years. Our museum contains two specimens. One was removed by Mr. Hawkins, the other by Keate in 1841. The latter is stated to have been large enough to contain three pints of fluid! It is now shrivelled, and shows little beyond the meagre remains of an old hydatid membrane. The Australian surgeons relate comparatively few cases. The only cases of this kind I myself have seen are two in number. The first occurred in a woman of about forty, an inhabitant of Cambridgeshire; here the cyst was in the pectoral muscle, and it protruded into the mammary substance. It was as large as a small orange, and readily cured by incision.

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[1] See a lecture by author on the "Diagnosis of Carcinoma," *Brit. Med. Journ.* 20th June 1896.

[2] "Considérations pratiques sur le galactocèle ou Tumeurs Lacteuses du Sein," *Bulletin gén. de thér. méd. et chirurg.* 1844, vol. xxvii. p. 355.

In the year 1897 I attended a lady, about forty-five years of age, who had a sinus just above the left breast, extending into the pectoral. This was the result of opening a cystic swelling, which contained hydatid fluid. The lady had been under the care of Dr. Shuttleworth of San Remo, who sent me some notes of the case.

The cyst may be situated in the gland itself, in the connective tissue behind it, or in the pectoral muscle. A large cyst may even perforate the thoracic wall.[1] Hydatids of the breast have almost invariably been observed in adult females. Birkett had seen two cases; in the one the whole breast was removed by B. Cooper. This author makes the important diagnostic statement, that we are unable to distinguish between hydatids and cysts containing serum or pus.[2] The *Old Catalogue* of Guy's Museum contains descriptions of three specimens.[3] One of these, removed by Cooper Foster, formed an elastic, fluctuating swelling in the mamma of a married woman aged twenty-nine. Haussman is said to have collected sixteen cases.[4] Five cases only are collected by Davies Thomas, and only one of these had occurred in his own experience.[5] Graham relates a remarkable case, and gives an illustrative plate, but it shows nothing beyond a large swelling of the mamma. The diagnosis was confirmed by puncture.[6] This author also refers to a case by Muskett in the *Australian Medical Gazette* for 1886; here the patient was a very young child.

Dr. Jonassen of Iceland has had the courtesy to send me his work on hydatid disease.[7] Out of thirty-five cases of external hydatids collected, only two were found in the mamma. He refers to the difficulty of diagnosis, and the close similarity to malignant tumours. Considering the number of cases of hydatids in Iceland, this is a good example of the rarity of the disease in the breast.

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[1] Landau, *Arch. Gyn.* Berlin, 1875, t. viii. p. 350.

[2] Holmes's *System of Surgery*, vol. iii. p. 450.

[3] 2291.

[4] *Die Parasiten der Brustdrüse*, Berlin, 1874.

[5] *Hydatid Disease in Australia*, vol. ii. p. 131.

[6] *Hydatid Disease*, 1891, p. 138.

[7] *Ekenoloksygdommen Beloet ved Islandske Legers Enfaring.* Dr. Archibald Garrod kindly translated this work, written in Danish, for me.

A hydatid of the female breast is reported by Luigi of Florence.[1] The patient was twenty-five years of age, and she had borne a tumour in the right breast for eighteen months. It was as large as a hen's egg and movable under the skin. "The tumour" was easily enucleated, and contained clear fluid, hooklets, and scolices. Allusion is made to the hardness of these cysts simulating solid tumours.

Henry gives an excellent example of hydatid of the breast, which had existed as a chronic swelling in the mamma of a woman aged twenty-eight.[2] The tumour was elastic in consistence, and the size of an orange. The cyst contained echinococci in abundance, and the patient had suffered from "tape-worm" in youth. I opine that this is the specimen in the Middlesex Hospital Museum,[3] and if so the cyst is really behind the mamma, not in it.

A specimen of hydatid cyst removed from the right breast of a woman aged thirty is described by Symonds.[4]

Bryant related a similar case. The tumour had been growing for five years in the breast of a widow aged thirty. It was obviously a cyst, and had attained to the size of a cocoa-nut. Its true nature was ascertained on exploratory puncture.[5]

In Gardner's case the base of the cyst, as large as a goose's egg, was embedded in the pectoral muscle. The tumour had existed for six years, commencing about the size of a pea. The servant of this patient had suffered from hydatids of the liver, and this inclined Gardner to suspect the same conditions in the mamma of the mistress.[6]

In Dupuytren's case the patient was thirty years of age, and the tumour the size of an egg. No notion of the true nature of the affection was appreciated, until an exploratory incision was made.[7] In a short clinical discourse, the celebrated surgeon passed in review a number of affections of the mamma, which might have been mistaken for the case he had just operated upon.

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[1] *Annals of Surgery*, vol. ii. 1885, p. 157.

[2] *Lancet*, 23rd November 1861.

[3] No. 2133.

[4] *Path. Soc. Trans.* 1886-87, p. 448.

[5] *Path. Soc. Trans.* vol. xvii. p. 276.

[6] *Lancet*, 8th June 1878.

[7] *Revue Médicale*, 1829, vol. i. p. 359.

M. Gerdy's case was very remarkable as it occurred in a child of only three years old, and the swelling reached from the clavicle to the xiphoid. Supposing it to be an abscess, Gerdy opened it by "plunging in a bistoury." He found four large cystic cavities full of hydatids, which he likened to the swimming bladders of a fish.[1] In Dubreuil's case, the tumour which had long existed in the breast of a woman of forty-four suppurated, and was practically converted into an abscess.[2]

Some other cases are reported in foreign literature, as Malgaigne's in a girl aged eighteen,[3] and a case by Bermund of Bordeaux. The latter author gives a long dissertation on the diagnosis of the malady, and speaks of the importance of the hydatid fremitus. I may say that I have seldom experienced this symptom in large hydatid cysts of the liver, and should hardly rely upon finding it in small cysts situated externally.

Diagnosis and Symptoms.—The symptoms of hydatid of the breast are those of cysts generally, and only those ignorant of the difficulties of diagnosis, would venture to give positive opinions in such cases, unless in the light of examination of the fluid or exploratory incision. A hydatid of the breast may of course suppurate, and simulate an abscess. The discovery of shreds of membrane or scolices in the discharge will make the case clear. The affection is usually found in adult females. The swelling is elastic, mobile, slow in growth, and usually not attended with pain or discomfort.

Treatment.—This is simple. Incision, evacuation of the contents, removal of the parent cyst, and drainage in a dependent situation, with strict aseptic precautions.

Dermoid Cysts.—I have never met with an undoubted instance of this affection, nor do I know of a genuine case having occurred in this country. Deeply-seated sebaceous cysts may readily be confounded with dermoids, and so may cysts containing inspissated collections of milk. Jamain and Terrier[4] refers to cases by Reverdin and Mayer, Hermann and Albert, which they consider genuine. The cyst removed by

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[1] *Bulletin de l'Académie de Médicine*, 1844, p. 517.

[2] *Bulletins et Mémoires de la Société chirurgicale*, 1890, p. 265.

[3] *Gazette des Hôp. de Paris*, 1853, p. 356.

[4] *Pathologie chirurgicale*, vol. iv. p. 712.

M. Gerdy, and referred to by Velpeau,[1] seems undoubtedly sebaceous. There is a specimen in St. Bartholomew's Hospital Museum (3188), where a cyst lay deep in the breast almost upon the pectoral muscle. Notwithstanding its depth, this formation is said to be sebaceous, but it may be a true dermoid.

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[1] *Diseases of the Breast* p. 248.

CHAPTER VII

SARCOMATA OF THE BREAST (TUMOURS TAKING THEIR ORIGIN FROM CONNECTIVE TISSUE, AND CHARACTERISED BY A TENDENCY TO GROW PROGRESSIVELY AND RECUR *IN LOCO*)

Difficulty of distinction from adenomatous tumours—Easy confusion with duct-cancer—Loose nomenclature of many museum specimens—Usual age for mammary sarcomata—Common varieties of structure—Cystic change—Myxomatous change—Naked-eye and minute appearances—Diagnosis—Treatment—Cases illustrative of recurrence *in loco*—Prognosis after operation—Cases to illustrate occasional chronicity of the growth, and its supervention upon tumours of an innocent nature.

THERE is no class of tumours more difficult to write of accurately and intelligibly than sarcomata of the breast. Every adenomatous growth is mixed with fibrous tissue in various stages of development, and the microscopical distinctions between this and sarcomatous tissue are often difficult and sometimes impossible. Moreover, the origin of a growth from glandular or from connective tissue is often no easy matter to decide. The microscopical distinctions between carcinoma and some forms of sarcoma, as the "alveolar," are sometimes very hard to discriminate. Finally, I may add that the description and recognition of that form of growth of the mamma known as "villous duct cancer" render it certain that many cases of this affection have in years gone by, been confused with cystic sarcomata. The similarity of villous duct cancer to sarcoma, so far as naked-eye appearance is concerned, is very close. If a growth of the breast contain tissue recognised as sarcomatous by the microscope, it should, I think, be termed a sarcoma, the association of glandular tissue being comparatively unimportant and obviously of secondary consideration. I am bound to point out that so great has been the confusion between sarcoma and fibro-adenoma of the breast, that statistics of comparative frequency, and of age, hitherto published, are greatly shorn of their value for clinical reliance. It is clear on reading the descriptions of tumours of the mamma characterised by rapid growth and great size, and termed "fibrous," that many of these were really sarcomata. I accordingly propose to point out that the natural history and degeneration of sarcomatous growths are exemplified in the breast, and that the microscopical and clinical distinctions between sarcoma and the more rapidly growing forms of the fibro-adenoma are exceedingly ill-defined.

A proof of the confusion which exists between fibro-adenoma and sarcoma must be apparent in any well-reported series of cases where the distinction is honestly attempted. Thus in the accounts of the fibro-adenomatous tumours in the *University College Hospital Reports* for 1881, one of the tumours is described as a recurrent glandular growth like ordinary fibro-adenoma, with many spindle cells in the stroma. In this case, a growth had been removed sixteen years before. It recurred, and the breast was amputated. A recurrence was removed two years ago, and there was "rather a large gland in the axilla" this time. Here, then, is a case which shows all the clinical characters of a recurrent sarcomatous growth, and yet the microscopist is inclined at the fourth recurrence to assign to it the name of fibro-adenoma. No stronger evidence could be given of the dubious nature of the prognosis of these tumours, from microscopical evidence alone.

In the chapter on fibro-adenomata, I have instanced other cases of return of these tumours, and have dwelt on the caution that must be exercised regarding the question of recurrence of any growth which has abundant embryonic nucleated tissue mixed with its stroma. The rarity, however, with which true recurrence is noted in tumours of the breast which are not carcinomatous, renders it certain that genuine sarcomata of the breast are far from common affections.

Authorities are at one in agreeing that sarcoma of the breast is exceptional, as compared with the adenoma or mixed tumour which I prefer to term fibro-adenoma. Bryant met with only four examples in his hundred cases. Gross, however, speaks with the experience of sixty cases, and perhaps with needless refinement classifies the ages at which the different structural varieties of sarcoma may be expected. Birkett, whose experience was very large, unfortunately does not differentiate adenoma and sarcoma sufficiently to make his descriptions conformable to modern pathological doctrines. Indeed, any accounts of these tumours written twenty years ago, are now very devoid of value for purposes of comparative frequency.

All the London museums, our storehouses of information concerning tumours, contain a number of growths of the breast, often labelled as "cystic sarcoma," which are characterised by large cysts and solid growths with much intracystic proliferation. So doubtful is the true nature of many of these complicated growths, that I think it more prudent not to consider them as undoubted instances of sarcoma. Indeed, all such specimens are in urgent need of re-examination and a modern system of nomenclature. Cases also occur which render it very probable that certain sarcomatous neoplasms originate as benign growths. Thus a woman may bear in her breast a tumour of the fibro-adenomatous variety, which may have existed for ten years or more, giving her little or no trouble. Suddenly, with no marked reason, the growth takes on a rapid increase, and in three months may double its size. On removal it will be found at one spot associated with a mass of undoubtedly sarcomatous tissue. The sudden and rapid increase of a long quiescent growth, therefore, unless due to extravasation into a cyst, is a serious symptom, and should lead to immediate operation.

Gross classifies the ages of his 60 cases of sarcoma as follows:—

Between the ages of 10 and 30 . .	18 cases
" " " 30 " 40 . .	23 "
" " " 40 " 50 . .	13 "
" " " 50 " 60 . .	4 "
" " " 60 " 70 . .	2 "
	60 cases

One only occurred before the sixteenth year. He found the majority of cases to occur during the period when the functions of the breast are most active, and the mean age to be about thirty-five years.

This differs somewhat from the results of my own investigations and from the researches of Bryant, who says that these growths rarely attack the breasts of young women, but rather those of over thirty or thirty-five, and they are not uncommon in women of about the age of fifty.

An examination of the cases at St. George's Hospital occurring in the thirty years after 1865, shows a number of instances of the tumour termed "cystic sarcoma" or tubero-cystic disease. There can be no doubt from the clinical history and rapid growth that many of these tumours were sarcomata, some were probably adenomata, and others varieties of duct-papilloma, with excessive intracystic growth. In 12 cases the diagnosis of sarcoma was undoubted. All seemed of the spindle-celled variety except one case of the so-called myeloid disease.

The ages were as follows:—

Between 30 and 40 . . .	4 cases
,, 40 ,, 50 . . .	6 ,,
,, 50 ,, 60 . . .	1 case
Over 60	1 ,,

In 14 specimens classified as sarcoma in the museum of the Royal College of Surgeons of England where the ages are given, the following results are noted—

3 cases	occurred	between	20 and 30
1 case	,,	,,	30 ,, 40
2 cases	,,	,,	40 ,, 50
8 ,,	,,	,,	50 ,, 60

again bearing out the conclusion that the disease is rather one of advancing life.

In 36 cases of probable sarcomata occurring at the Middlesex Hospital between 1875 and 1895, in which full particulars of age are given, we observe the following:—

Between 15 and 30	. .	4 cases
„ 30 „ 40	. .	1 case
„ 40 „ 50	. .	14 cases
„ 50 „ 60	. .	5 „
60 „ over	. .	12
		36 cases

Of 13 cases of probable sarcoma and cystic sarcoma of the breast admitted into University College Hospital between 1877 and 1890, and mentioned in their reports, the ages were as follows:—

Between 15 and 30	. .	no cases
„ 30 „ 40	. .	1 case
„ 40 „ 50	. .	4 cases
„ 50 „ 60	. .	8 „
		13 cases

In the museum of the London Hospital are 18 specimens labelled as sarcoma. Of these, 5 are mucoid, and may be termed myxo-sarcoma. Cystic degeneration is common.

In structure spindle-celled sarcoma occupies the first place.

The ages are as follows:—

Between 20 and 30	. .	1 case
„ 30 „ 40	. .	1 „
„ 40 „ 50	. .	5 cases
„ 50 „ 60	. .	no cases

There was 1 case at the age of eighty-four.

The structure of 17 specimens at the Royal College of Surgeons gives us the following results:—

Spindle-celled sarcoma of various types . .	7 cases
Mixed round and spindle-celled . .	4 „
Myxo-sarcoma	6 „
	17 cases

There are no described specimens of the "myeloid" disease.

The specimens at University College Hospital Museum show many tumours, labelled as sarcomata, of great size, removed by Liston, under the heading of cysto-sarcoma and adeno-sarcoma. Many varieties of growth are doubtless included among these tumours, and the same may be said of the extensive collection in the Guy's Museum, which are classified under the old nomenclature.

The ages of 7 cases which seem clearly to be sarcomata are thus given :—

Between 20 and 30 . . .	no cases
" 30 " 40 . . .	1 case
" 40 " 50 . . .	2 cases
" 50 " 60 . . .	2 "
" 60 " 70 . . .	2 "

As a practical rule, it is obvious from the above tables that sarcoma of the breast may occur at any age. I myself[1] have recorded a case operated upon by Sir George Humphry in a girl of fourteen. The tumour, of rapid formation, was a typical spindle-celled sarcoma with mucoid change. The wound was stuffed with lint and made to heal by granulation, as was then Sir George's frequent practice in such cases. The tumour was gelatinous and had a very malignant aspect, but twelve months after the operation the patient remained quite well. There is a remarkable specimen in the museum of the Royal College of Surgeons of a "myxo-sarcoma" removed from the breast of an infant only six months old. It was thought to be a nævus, but rapidly increased. Many dilated vessels were found round it. Eighteen months after operation the child was quite well.[2] In the chapters on carcinoma it will be pointed out that cases classified as carcinoma, before the age of twenty, are really sarcomata, and it is clear that malignant tumours of the mamma occurring in early life may be generally thus considered.

The etiology of sarcoma of the breast is as obscure as the origin of the disease elsewhere, and attribution of the malady to blows or squeezes is fairly common, but generally quite devoid of certainty.

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[1] *Brit. Med. Journ.* 1883, vol. i. p. 965.

[2] I. ix. 4728 C.

Histology.—As regards the minute structure of sarcomata of the breast, it has to be remembered that a tumour of this nature can only be named according to the preponderance of one type of cells over another. Few are the sarcomatous tumours that are not mixed in character, which do not contain cells of different forms and in various stages of development. The more embryonic the cellular elements, and the less they incline towards the formation of spindle-shaped cells, the more malignant is the case, and some forms of soft round-celled sarcoma of the breast, where the cellular elements are large, abundant, and "multinucleated," are worse in their clinical aspects than any cancers. Especially is this the case when such growths develop during pregnancy or lactation. It may with truth be said, that sarcoma of the breast exhibits the usual types of sarcomatous disease. The spindle-celled sarcoma of the large and small celled variety seems to be most commonly met with. The round-celled sarcoma comes next in order, and lastly the myeloid disease. Regarding this latter a word of explanation is needed. Myeloid disease is said to be excessively rare in the breast, and the few recorded cases point this out prominently. If by myeloid disease is meant the occurrence in tumours of the breast of cells identical with those of the marrow of bone, I more than uphold this opinion, for I doubt if they ever occur. In rapidly-growing embryonic tissue such as is exemplified by very soft and malignant sarcoma, large multinucleated cells are very frequent, and a careful search will generally enable the observer to discover them. They are exceedingly like the cells found in myeloid

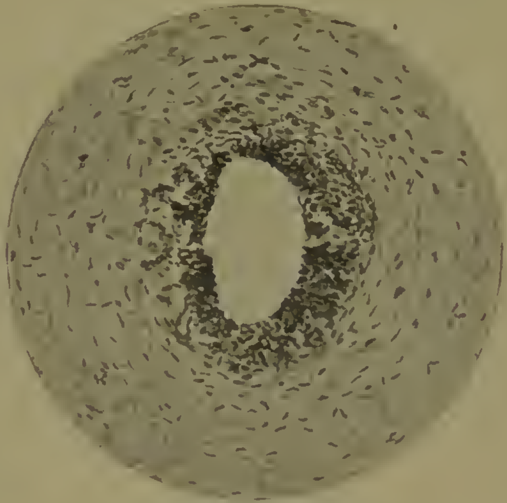

FIG. 35.—Small spindle-celled sarcoma surrounding a mammary duct.

disease of bone, and if abundant can hardly be distinguished from them. The cells of sarcomatous tumours crowd around the numerous vessels which traverse the growth, and close examination will show that they may form part of the vessel-walls or project into their interior. Areas of mucoid change, of hæmorrhage, or of fatty and caseating tissue, are very common, and if the section has traversed one of the numerous cysts, this may be filled with altered blood, mucoid material, soft proliferating growth, or amorphous substance. The worst kinds of these tumours are quite gelatinous, containing a glairy fluid—which will escape on tapping with a trocar and cannula—closely simulating a simple cyst. If sections of different parts of the same tumour be examined, the pathologist will often have much difficulty in assigning to the growth its proper name, for different types of cells will be found, according to the rate and progress of the disease. The prognosis of the tumour will largely depend upon the character of the cells rather than on their shape, and the microscopical diagnosis of sarcoma will depend upon observing that the cells are always separated by intercellular substance, and that this rule holds good even if an attempt at alveolar arrangement appears to have been made. In some sarcomata the ordinary fibrous septa of the gland may be mistaken for alveoli. Alveolar sarcoma of the breast has, however, been described by highly competent observers, especially by Billroth. Parasitic sporozoa have also been clearly described by some observers, and as strongly negatived by others. For instance, Clarke described in detail these

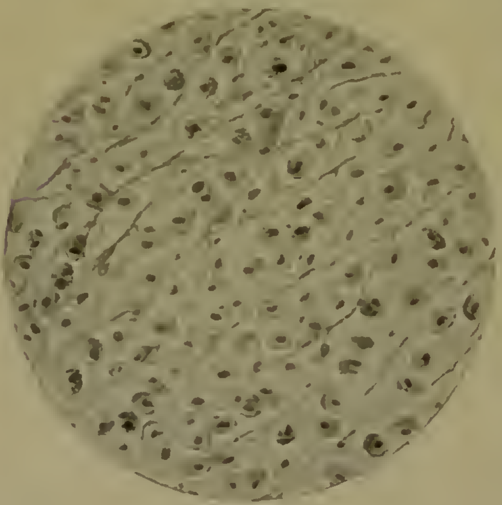

FIG. 36.—Lympho-sarcoma of the mamma. The delicate reticulum simulates an alveolar structure. This variety is very malignant.

bodies as occurring in an alveolar sarcoma. Shattock and Kanthack disputed his views, and the latter declared that the appearances were merely "degenerative" products.[1] In mammary sarcomata, especially, foreign elements termed "rests" or sequestrations (Cohnheim) have been described. Some of these have been cartilaginous, others unstriped muscle, or tissue like it. The origin of sarcoma in such structures is not yet proved,[2] though it seems likely enough.

According to Gross in his classical article on sarcoma of the female breast, in 156 cases spindle-celled sarcoma constitute 68 per cent, round-celled 27 per cent, and myeloid 5 per cent of all recorded cases.[3] Cystic degeneration is exceedingly common in mammary sarcomata. So universal is this change, that the name of cystic sarcoma is often given to the disease. Cysts form in sarcomatous growths in one of the following ways.

(1) Mucoid degeneration of cells.

(2) Hæmorrhagic extravasation.

(3) Obstruction of ducts by growth or pressure.

(4) By the inclusion of spaces between proliferating intracystic growths.

(5) By a combination of these processes.

The large number of ducts leads to the conclusion, that duct obstruction has much to do with the numerous cystic formations that are found in these growths. The varied and curious contents of the cysts are due to secretions from the walls of the ducts, to mucoid degeneration of cells, and especially to changes in the blood, which from time to time becomes extravasated into them. Thus cysts may vary in size from a cocoa-nut to a grape. They are usually multiple, but one may be much larger than another. The contents may be clear or straw-coloured, or brown, like the colour of chocolate; commonly the fluids are viscid and glairy in consistence from mucoid change in the cells. Some cysts may apparently contain pure blood, others soft and diffluent breaking-down sarcomatous growth, almost indistinguishable from blood itself. Many of the cysts have secondary soft proliferous growths in their walls, and these may be so abundant as to fill the original cavity, giving the aspect of secondary encapsuled tumours. On the other hand, they may be so soft as to break down and fill the cyst with blood and soft diffluent growth. Very rarely the endothelial lining of sarcomatous cysts takes on a concentric arrangement. To soft sarcomata the old terms "encephaloid" or "medullary" were often applied: many cases which used to be termed clinically "encephaloid" cancers were really soft vascular sarcomata. There can be no doubt that many of the tumours of the mamma spoken of as myxomata, are really myxo-sarcomata, or mucoid degenerations of sarcomata.

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[1] Meetings of the Path. Soc. London, 6th April 1895.

[2] See an elaborate paper on the rôle of "rests" in the origin of tumours by Williams, *Brit. Med. Journ.* 10th October 1896.

[3] *Internat. Journ. of Med. Sciences*, 1888, vol. xcv. p. 219.

Thus a case of myxomatous tumour of the mamma is recorded by Mr. H. Morris in vol. xxiii. of the *Path. Soc. Trans.* It recurred after removal, and was removed by Nunn with the galvano-cautery, chloride of zinc paste being afterwards applied. The Morbid Growths Committee believed it to be a myxoma. I think that most modern pathologists would have considered this tumour a sarcoma undergoing mucoid degeneration, and given to it the term "myxo-sarcoma."

In exceptional instances, calcareous degeneration is met with in the septa of the tumour or walls of the cysts, or areas of cartilage (chondrifying sarcoma) are found mixed with the original growth. Both these degenerations are so rare that a surgeon in large hospital practice may never meet with them. Primary melanosis of the breast substance itself is unknown, though, as pointed out in Chapter IV., melanotic growths may originate in moles about the skin of the mamma or axilla. In very rare instances secondary melanotic growths may occur in the breasts in cases of general dissemination of the disease.

There is a valuable specimen to show this in the museum of St. Bartholomew's Hospital (3186). This was removed from the breast of a young woman who had disseminated melanosis following the removal of a melanotic mole on the back. Bryant also in his work on diseases of the breast (p. 231) relates two cases of secondary melanosis of the breast, following removal of degenerated "moles" from the skin of the forearm and front of the sternum.

The alteration in extravasated blood found in some sarcomata, and especially in villous duct cancers, closely simulates melanosis to the naked eye, and has sometimes been confused with it.

Thus Butlin showed a specimen which he considered to be an alveolar sarcoma of the breast at the Pathological Society of London on 4th January 1887. The patient was a woman sixty-four years of age. She was operated upon in 1880, and a tumour was then removed which was found to be "melanotic" on section. Recurrence took place in 1882, in 1884, and in 1887. The tumours removed from the scar on these occasions had similar characters; other speakers, however, doubted that the specimens were really melanotic, and considered the pigmentary changes were secondary to extravasated blood. The Morbid Growths Committee found no true pigment in the cells, and considered the tumours to be carcinomatous. No case could more strongly illustrate the histological difficulties encountered in these cases, and in distinguishing some kinds of carcinoma and sarcoma.

In a paper by Williams in the *British Medical Journal* for 10th September 1892 on the relative frequency of various mammary tumours not a single case of true primary melanosis of the breast is reported.

Naked-Eye Appearances.—In modern days we do not often see the huge lobulated tumours of the breast, full of cysts, and sometimes fungating, which are so well described by past writers. Increased confidence among the public, and surgical knowledge generally, now lead to the comparatively early removal of mammary tumours. A sarcoma in its early stages, even though soft and brain-like, will usually be encapsuled, and does not incorporate with the surrounding mammary tissue, like cancer. I have never seen an early specimen of mammary sarcoma which was not more or less encapsuled. There is an excellent series of these tumours in the museum of Westminster Hospital (1111-1116). The specimens, the best I am acquainted with in London, exhibit the encapsuled condition to a marked degree. According to its nature, the growth will be soft and medullary or firm and fleshy. The spindle-celled growths are white or rosy pink in colour, and firm on section, but the more rapidly growing tumours will be soft and gelatinous on section, or dark and hæmorrhagic; and the knife will pass through cysts containing various contents, and areas of soft sarcomatous tissue, splashed with patches of a reddish or ochre colour, when hæmorrhages or fatty degeneration and caseation have occurred. The amount of mucoid change may be very considerable, so that the whole tumour is converted into a jelly-like mass, which may clinically be readily confounded with a cyst. The firmer varieties of sarcoma may displace the mammary tissue from their walls. This is especially the case with the varieties which so closely resemble fibro-adenomata. Sarcoma of the mamma may attain to an enormous size, though in these days such conditions are rare. Most museums contain examples of these huge tumours; one of the largest specimens I know of is in the museum of the Royal Infirmary of Edinburgh.[1] This tumour is brain-like in consistence, and seemed to have really originated beneath the breast, which was in front of it. After removal it recurred, and penetrated the thorax. Lastly, it may be observed that an inspection of a large number of museum specimens has convinced me that cystic change in sarcoma is generally associated with great size of the tumour. The smaller growths are firm and flesh-like, surrounded by

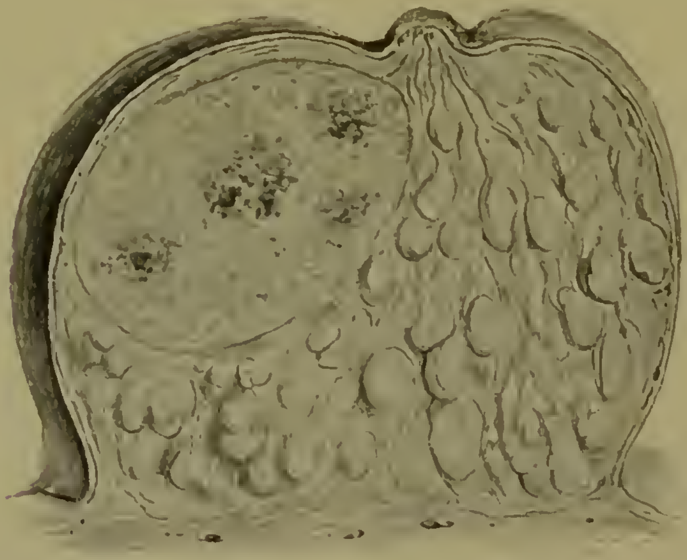

FIG. 37.—A mamma containing an encapsuled soft sarcoma full of hæmorrhages.

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[1] 2724, XXXIV. c.

well-defined capsules, and not unlike in appearance some of the softer varieties of fibro-adenoma.

Clinical Characteristics and Diagnosis.—Sarcoma forms a single tumour in any part of the breast. Rarely the growths are multiple or bilateral. Increase of the tumour is progressive, and the rapidity will be proportional to the embryonic nature of the growth and its malignancy. When cysts form, hæmorrhagic or other exudation into them may lead to sudden and alarming increase. Should sarcoma occur in the breast during pregnancy and lactation, it will grow with fearful rapidity, and quickly destroy life. In the majority of cases it forms a firm lobulated tumour devoid of the hardness and extreme mobility of fibro-adenoma. The nipple may or may

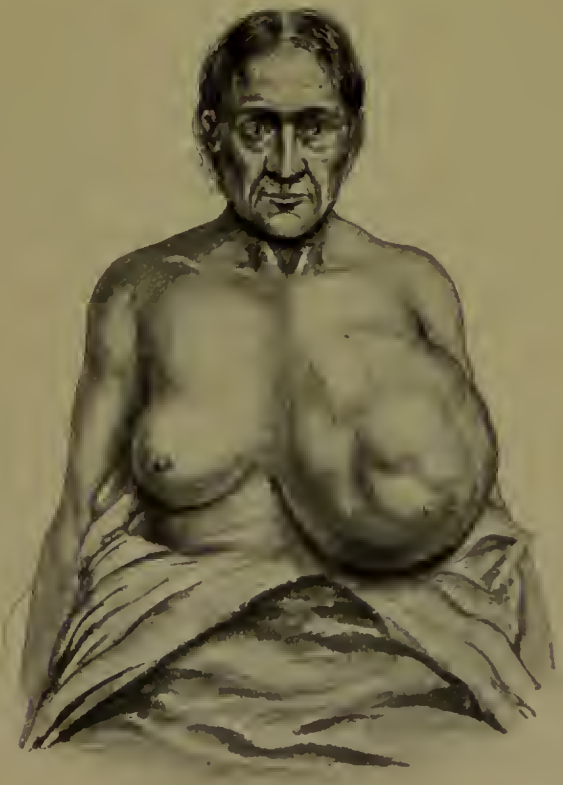

FIG. 38.—A huge cystic sarcoma of the mamma with distended veins on the skin.

not be retracted, but is not drawn progressively to the growth, as is the case in carcinoma. If the tumour be very large, the nipple may readily seem retracted, from the advancement of the growth round it, and the clinical observer must be careful not to confuse this appearance with true retraction. The skin is not puckered, and the axillary glands will probably not be affected, but too much reliance must not be laid upon such symptoms. One or more of the smooth prominences of the tumour, may give the sense of elasticity so suggestive of cysts, and the cutaneous veins will frequently be enlarged, coursing as blue streaks over the slightly distended and congested skin. Hæmorrhagic or other discharges may occur from the nipple, as in other cystic affections of the mamma. The patient will probably appear in good health and be upwards of forty years of age. When the tumour has been allowed to grow as large as a fœtal head or a cocoa-nut, very definite symptoms are developed. The colour of the skin over large sarcomatous tumours is very distinctive. It is stretched, thinned, and may be slightly congested and pigmented, or livid and marked with large veins. In several cases I have seen, spontaneous ecchymoses have occurred in the skin as also was noticed in Cadge's celebrated case (Plate X.). The lobulated prominences of the tumour grow into huge rounded bosses, which distend the skin and threaten to burst through it. Large cysts are almost universal, or the protuberances may be so soft and brain-like that pure cystic formation is most closely simulated. If one of the protuberances be tapped, thick, viscid, straw-coloured fluid, or apparently pure blood may be withdrawn. The tumour will be heavy, and the irregular lobulated shape of it will be very characteristic. Should fungation ensue, the edges of the aperture in the skin will be clear-cut, and exuberant foul granulations will protrude. The integument will not be infiltrated. Profuse hæmorrhages will occur, or abundant watery discharge of an offensive odour. It will be noted that the appearance much resembles that seen in cystic adenoma, but the history of the case may differentiate. An innocent tumour would take years to attain to such dimensions. Nevertheless it may be readily understood on reading the above, how difficult it is in the case of a firm lobulated tumour of the breast,

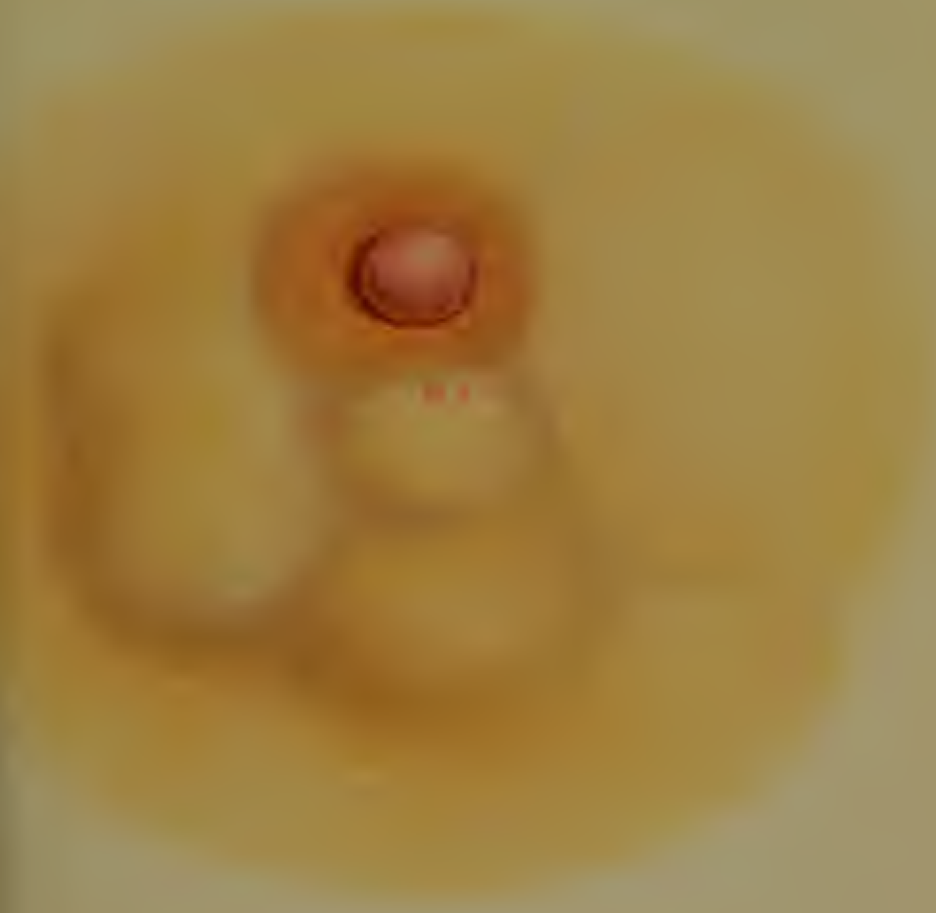

PLATE IX.

A cystic affection of the mamma. In this case exploratory incision revealed multiple cysts containing coloured fluids, in a sarcomatous growth. (Cystic sarcoma.)

say the size of an orange, to diagnose between sarcoma and some of the more rapidly-growing forms of fibro-adenoma. The distinction is obviously an important one for treatment. Such cases will occasionally occur, and the question as to whether the whole mammary gland should be excised or not will present itself. Here the continued progress and comparatively rapid growth of sarcoma will be a very important consideration, and will guide the surgeon towards the major operation. The appearances on exploratory incision are also very important to consider.

If I were asked the leading differential clinical sign between firm sarcoma and fibro-adenoma, I should undoubtedly reply, rapidity of growth of the former and comparative hardness of the latter. Next in order I should take mobility, for sarcomata, though encapsuled, seldom roll about like pure fibroma or fibro-adenoma, and do not turn out of their capsules with the same facility when incised. Fibro-adenomata rarely commence after the age of thirty. Sarcoma commonly does so. In cases of large, soft, brain-like sarcomata, with free vascular supply, the local and bodily temperature may be considerably raised, simulating very closely the febrile symptoms one finds in suppuration. Elevation of temperature in sarcoma is not confined to growths of the breast. I have known it occur in sarcoma of the testis, and it is a very misleading symptom in practice unless the surgeon is aware of its occurrence.[1]

Treatment.—In any case when there is good reason to suspect sarcomatous disease of the breast of a soft and rapidly increasing nature, very free removal of the gland, and especially of the skin over it, and subjacent fascia, should be carried out. I should deem it safer also to remove the axillary fasciæ and glands. The operation presents nothing peculiar; completeness of removal should especially be aimed at. Recurrent nodules should at once be freely excised, and many cases are recorded to encourage the surgeon in this respect, where repeated removals have been effected, keeping the disease in abeyance and check, or ultimately obliterating it entirely. Should the growth have fungated before operation, elaborate care should be taken to disinfect the foul septic tissues. The pure carbolic acid may be applied several times, and at the time of operation the whole of the fungating tissues should be destroyed with the cautery, before the surrounding skin incisions are made. I am cognisant of fatal sepsis having occurred in a case of this nature from neglect of these precautions.[1]

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[1] If a soft sarcoma has been punctured by a septic trocar or grooved needle, it may inflame and closely simulate abscess.

The remarkable tendency of spindle-celled sarcoma to recur locally is noticed by many authors, and numerous cases could easily be quoted. A notable example is related by the late Mr. John Gay. The patient died exhausted at the age of forty-eight. She had been under treatment for nineteen years, and had at least nine recurrences.[2] A similar instance was operated upon by Campbell, de Morgan, Heath, Erichsen, and Hewett, the tumour obstinately recurring in spite of an array of such surgical talent.[3]

A still more striking instance is recorded by Cadge of Norwich. A lady aged thirty-seven showed him an apparently cystic tumour about the size of the closed fist just above the nipple. He passed a trocar into it, but only jelly-like substance appeared. The skin over the tumour showed ecchymosis. The breast and growth were removed, and the latter was as soft as "calf's-foot jelly." She died of exhaustion in two years. During this period she underwent no less than nine operations, the tumours returning persistently in the scar, and ultimately invading the thoracic wall. One of the operations was performed during pregnancy, and doubtless this condition added to the malignancy of the disease.

A very similar and equally remarkable case occurred in the practice of Pritchard;[4] here the primary growth was a hæmorrhagic cyst full of spindle-celled sarcoma and blood. The patient nearly died of bleeding at the first operation. This lady, aged forty-five, underwent a number of operations and succumbed at the age of seventy-four, with extensive and virulent recurrence.

The mamma may be invaded by extension in this form of sarcoma. This is well illustrated by a celebrated case of Fergusson's, where the growth began as a nodule just below the left clavicle. It was removed at Birmingham, and, on its return, by Pollock in London. Then there was an interval of five years of freedom from disease, but the growth again returned and invaded the mamma. Fergusson operated, but again the growth recurred. This patient had ten operations and then died of some cause not connected with the tumour.

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[1] The important subject of disinfection of ulcerating growths will be again alluded to in treating of the operation for breast-cancer.

[2] *Catalogue of Royal College of Surgeons*, I. ix. 4787.

[3] *Brit. Med. Journ.* 9th February 1878.

[4] *Trans. Bristol Med.-Chir. Soc.* 1878, vol. i. pp. 94-96.

The lesson taught by all such cases is, the importance of very freely removing the original growth and the breast, with the pectoral fascia and axillary connective tissue.

Prognosis.—The prognosis of sarcoma must always be guarded, and will be in direct proportion to the rate of growth and characters that the tumour presents. Soft, rapidly growing, round-celled or large spindle-celled sarcoma are very malignant; and the prognosis of such tumours is exceedingly serious. The firm, fleshy varieties are more tardy in recurrence, and by early excision of recurrent nodules favourable results may be obtained. In some unfortunate cases each recurrence is more malignant than the last, fungation of soft sarcomatous growths occurring before the wound has healed. The intercostal muscles and pleura become rapidly infiltrated with growth, and the patient dies exhausted and emaciated with hæmorrhagic pleural effusion. Sarcoma of the mamma, like sarcoma elsewhere, has a special tendency to recur *in loco* in the original cicatrix, or to exhibit secondary deposits in other parts of the body. In the more malignant varieties of the disease, metastases are almost as common as they are in cancer. The axillary and cervical glands are comparatively seldom affected. Cases are not wanting to prove the exception to this rule, and masses are sometimes found in the axillary and mediastinal glands, the disease following the lymph paths with the pertinacity of cancer. To attempt to reduce the duration of life after removal of the breast for sarcoma to "average periods," or to state a "percentage of cures," is a matter of so great doubt and uncertainty that I will not attempt to make statements which, though collated from the best sources, and with the best intentions, may be really devoid of that accuracy so essential to reliable clinical guidance. Some of the recorded cases will demonstrate the remarkable fact, that by repeated operations the disease may be kept in check, if not entirely eliminated. Among the more remarkable instances of this fact are the cases related by Bryant and Gross. The former surgeon operated upwards of seventeen times upon a case of recurrent spindle-celled sarcoma, with apparent cure. The patient, singularly enough, bore an atrophic scirrhus in the opposite breast, effecting a demonstration that several kinds of mammary neoplasms may coexist.

The following case will give the reader a good idea of the clinical characters of a large sarcomatous tumour of the mamma, containing many cysts. The history of one of such cases is the history of all.

In May 1895 there was shown at "consultations" at St. George's Hospital a married woman aged fifty-three. She had a family of three, and was only able to suckle one on account of constant trouble arising from maldevelopment of the right nipple. There was a history of a blow seven years ago, and lately she had to lift a sick husband, which "strained" and hurt the mamma. For about twelve months she had noticed a swelling in the breast, which increased to a great size lately. A surgeon outside the hospital opened it, and stated in his letter that about "two pints" of clear fluid escaped. There was no history of discharge from the nipple.

The patient was a stout well-nourished woman. The upper and anterior part of the right breast was occupied by a lobulated swelling the size of a small turnip, the skin being livid and marked by numerous enlarged capillaries. The swelling was of elastic consistence, moved on the chest-walls, and seemed to occupy the upper part of the breast; the lower part of the gland, with the nipple, being free. A hard cord extended into the axilla, which at first sight gave the idea of lymphatic infiltration, but on close examination it seemed more probably due to the dragging of the enlarged breast upon the axillary fascia. There was an open incision above the nipple, from which clear serous fluid abundantly escaped. No enlarged glands could be felt, and there was no sign of visceral infection. On 28th May the breast was removed. Its inner half was replaced by a soft fleshy growth the size of a melon, which infiltrated the pectoral muscle beneath. In the breast the growth was rigidly circumscribed, but not distinctly encapsuled. It was hollowed out in its centre by a large cyst, containing pus, and sloughy masses of disintegrating growth. Under the microscope, round-celled sarcoma was evident.

The clinical symptoms of sarcoma of the breast showing the chronicity sometimes observed, are well exemplified by the notes of the following case, taken from the *University College Hospital Reports* for 1889.

A married woman, a multipara, aged fifty-three, noticed between seven and eight years before admission a small hard lump in the right breast. It increased slowly, and three years ago became the seat of lancinating pain. It was treated with lotions and medicines. For the last fourteen months the growth had been more rapid and the pain more severe, owing to a supposed blow on the breast. The patient was a plethoric woman. The right breast was occupied by a prominent rounded tumour, measuring 10 inches across its surface. The outlines of the tumour were rounded and well defined ; its consistence was firm, except at the most prominent part, where there was a distinct sensation of fluctuation over an area 3 inches in diameter. The skin was here thinned, and bluish-red in colour, and the superficial veins were distended. Elsewhere the skin was normal, and nowhere adherent. The nipple was flattened out, and situated on the outer part of the tumour. The whole growth was movable on the deeper parts. There were no enlarged glands in the axilla.

Here we have a tumour in the breast of a woman of over forty, which increases slowly and then rapidly after a cause of irritation. The skin, nipple, and axillary glands remain unaffected. At one spot cystic formation is evident. The tumour, though of such large size, is movable, and has not infiltrated the deeper parts. The woman is plethoric and in good health.

A remarkable instance of chronicity in a sarcomatous mammary tumour is also recorded by Mr. William Anderson.[1] The tumour had started in the site of an old mammary abscess and had existed for twenty-eight years. Three years before removal it rapidly increased and became cystic. It was removed in May 1872, was of very large size, and presented the characters of spindle-celled sarcoma. Three weeks after removal rapid recurrence took place, and the growth was again dissected away, but a second recurrence took place, and the patient rapidly sank. Curiously enough, a microscopical examination of the last growth showed a great change of type, the tumour appearing, according to Mr. Anderson, to be anatomically a carcinoma. A careful study of the appearances he describes, however, makes one suggest that the true nature of this tumour was of the nature of lympho-sarcoma.

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[1] *Path. Soc. Trans.* vol. xxiii. p. 254.

A recognition of such cases is very important, as showing that a tumour may have existed for years, and yet have sarcomatous tissue developed in it.

The following case illustrates that sarcoma may originate near the mamma and secondarily affect the spine. The history is very suggestive that the growth began in an axillary mamma, or in an axillary prolongation of mammary tissue. It forcibly illustrates the caution we ought to adopt in the examination and prognosis of such tumours. The case is related to have much improved under the injections of erysipelas toxins.

A lady, aged twenty-eight years, had a small tumour situated about half-way between the right breast and axilla, removed a year and a half ago. It was pronounced benign by the surgeon, but it is doubtful whether a microscopical examination was made. A year ago she began to develop a small swelling in the spine, about the tenth dorsal vertebra. It was supposed to be due to early Pott's disease, and was treated accordingly. In June she consulted Dr. V. P. Gibney, of New York, who considered the diagnosis of Pott's disease as probable, and treated her for some time with a plaster jacket. The jacket caused increase rather than decrease of the pain; the swelling slowly but perceptibly increased in size, and her general health became very much impaired. In December 1894 the tumour had become of such size and the pain so severe that the theory of Pott's disease was given up, and a diagnosis of sarcoma of the spine was no longer doubtful.[1]

In like manner sarcoma of the breast may secondarily affect the cerebrum.

Hale White, speaking at a meeting of the Medical Society of London,[2] referred to a woman who had Jacksonian epilepsy, the attacks commencing in the right hand. She was operated upon by Lane, who found the cerebral cortex apparently healthy. He removed it, however, and the sections showed a sarcomatous growth. The breast of this patient had been previously removed at St. Thomas's Hospital for sarcoma.

The following case illustrates the important phenomenon of spontaneous ecchymosis over the tumour.

A married woman, aged forty-eight, was in the Princess Ward of St. George's Hospital under the care of the late Mr. Rouse, in July 1896.

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[1] Coley, *American Journal of Medical Science*, September 1896.

[2] *Trans. Med. Soc. Lond.* vol. xviii. p. 69.

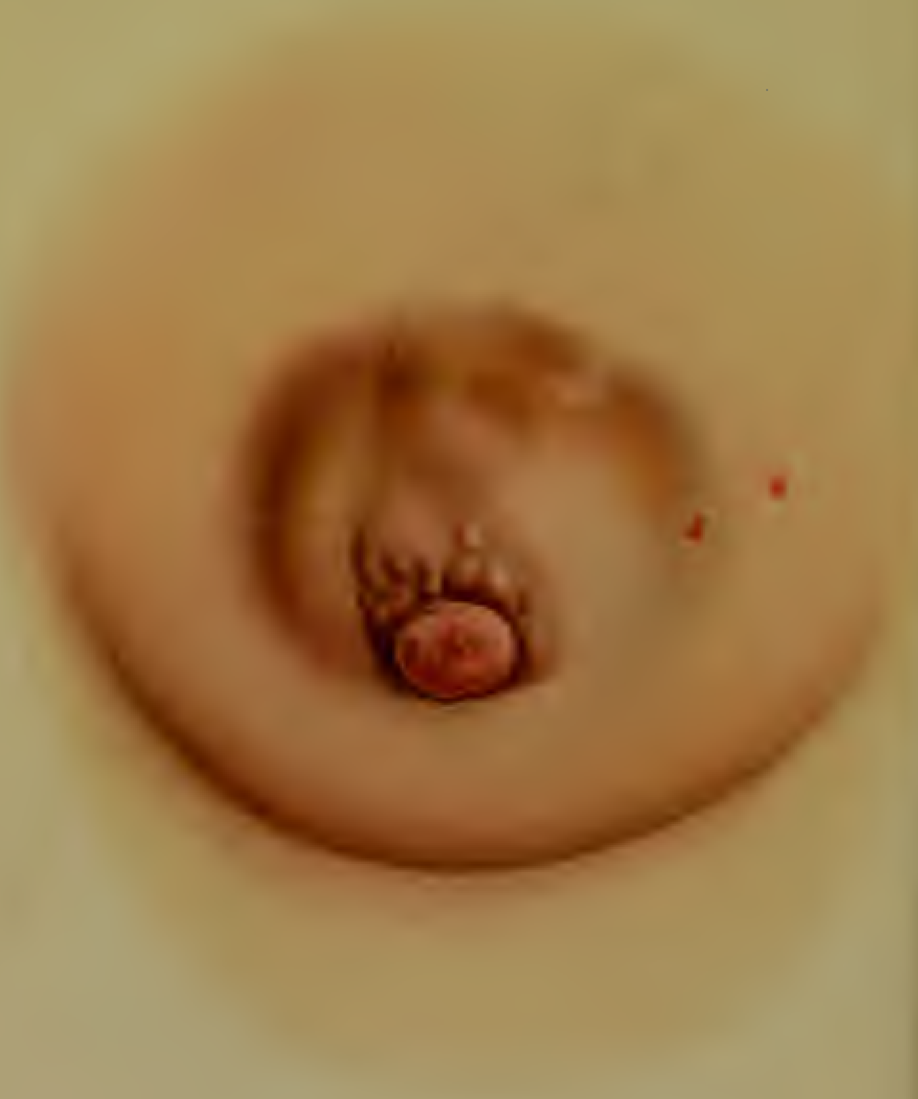

PLATE X.

Spontaneous ecchymosis over a rapidly growing sarcoma of the mamma. There is a bloody discharge from the nipple. Two red spots (telangiectasis) are seen on the right. (Taches de Morgan.)

To face p

There was a firm swelling of doubtful history in the right breast, with a bloody discharge from the nipple. There had been spontaneous "bruising" over the breast on several occasions. The tumour was movable, and the axillary glands were not affected. The whole breast was removed. The tumour was distinctly encapsuled; it was firm and fleshy, and contained cysts. Under the microscope the growth was a spindle-celled sarcoma.

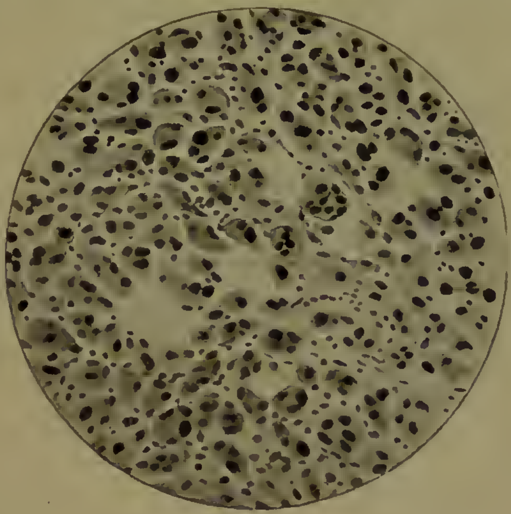

FIG. 39.—Multinucleated sarcoma of the mamma. This would be termed by many myeloid disease.

"Myeloid" disease of the breast is undoubtedly rare, but the following recorded cases will go to prove the existence in the breast of tumours which, in addition to round and oval cells, have large irregular protoplasmic cells, with many nuclei scattered in their substance, resembling those found in certain tumours of bone. I cannot but think that such structures may be found in any quickly-growing sarcomatous tumours, and are especially likely to be observed in the later recurrences of sarcoma, when the tumours are very ill-defined in character. It is erroneous to consider these tumours as identical with myeloids of bone.

A woman, aged forty-five, was under Mr. Stanley's care in St. Bartholomew's Hospital in 1847. An oval nodulated tumour, hard and incompressible, was removed from the left breast, the surrounding tissue being excised with it. The cut surface was blotched with blood-coloured and rusty patches, and the microscopical characters were those of "myeloid" disease. Five years after the operation she was readmitted with a "true hard cancer" in the scar. This was freely removed. A year later she appeared with another recurrence. This was again removed, and in two years she returned with cancer of the right breast. While this patient was under observation her sister came under care for a cancer of the breast, which was removed, but recurred. This account is from Sir James Paget's notes in vol. vii. of the *Clinical Society's Transactions.*

A woman, aged sixty-four, was admitted into St. George's Hospital on 18th October 1873. Thirteen years before, a tumour had been removed from the right breast by Mr. Paget. Ten years ago it recurred, and was again removed. Four years ago the tumour again recurred, and the whole breast was removed, the mass being of an exceedingly large size. On admission there was a large, hard, bleeding, irregular mass extending up the side and over the situation of the cicatrix. The general health of the patient remained tolerably good. The mass was again removed, but the patient sank and died after the extensive operation needful. The tumour was examined with the microscope and proved to be so-called "myeloid" disease. The description leaves no doubt of the nature of the growth.

Mr. Warrington Haward's reported case of recurrent myeloid tumour of the breast is of a very interesting nature.[1] A woman, aged sixty-four, had a tumour removed from her breast in 1860. It recurred in 1863, and was again removed. In 1867 another large tumour formed, and then for the first time the whole breast was removed. In 1873 an ulcerating tumour appeared in the scar. Again removal was attempted, but the chest wall was too extensively implicated. After the patient's death the growth was found to have invaded the intercostal muscles, and it projected into the pleural cavity, pushing the pleura before it. Microscopically it had all the characters of myeloid disease.

A breast carcinoma which twice recurred, and is stated to have had well-marked myeloid cells mixed with the cancer, is related in the *British Medical Journal* for 13th January 1894 by Snow.

A widow, aged forty-four, was admitted into the Rosebery Ward of St. George's Hospital, under Dr. Whipham's care, on 22nd January 1895. She had ten children, and was able to suckle with the left mamma as well as the right. She was admitted for supposed rheumatism, *i.e.* pains in the hands, feet, and knees. The patient had noticed a lump in the left breast for six months. When she first noticed the formation it was the size of a marble, but it has been growing rapidly. The left mamma was occupied by a tumour the size of a large orange, elastic and semi-fluctuating. The nipple was not retracted, but some yellowish fluid exuded from it on pressure. The skin was not implicated, but a little livid in colour and marked by enlarged veins. The axillary glands were not involved. The tumour was movable upon the pectoral fascia. She has no pain in the tumour, and has not lost flesh.

30th January.—The tumour has grown since last note with extraordinary rapidity and nearly doubled its former size. It was removed by Mr. Pick. On first examination the tumour was brain-like on section and full of blood. There was no distinct cyst. The more peripheral parts of the growth were firm and fleshy. The centre of the tumour was quite breaking down, and large areas of it were distinctly caseating. The axilla was not opened at this operation.

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[1] *Trans. Clin. Soc. Lond.* 10th April 1874.

Examination of a fresh section under the microscope, showed a growth composed of round or oval cells of large size, with plump nuclei mingled with amorphous débris and blood. By careful focussing a delicate flimsy reticulum could be observed forming a framework among the cells. The growth was a typical example of "Lympho-sarcoma." In other parts the disease was distinctly "myeloid" in character. The microscopical appearances were very singular.

On 11th March this woman came to the out-patient department with virulent recurrence. There were several tubers the size and colour of tomatoes in the scar, and the axillary glands and glands in the neck were full of growth. She was admitted and treated with injections of the "Coley's fluid," but died of pyæmia.[1]

In the remarks upon cartilaginous tumours affecting the breast, it is pointed out that such cases are practically always sarcomata mixed with cartilage, and even these are sufficiently rare. Osteoid change is still more exceptional.

One of the few recorded cases of this disease will be found related by Bowlby.[2] It was removed from the right mamma of a single woman, aged forty-two. The general appearance of its cut surface was that of a cystic sarcoma with intra-cystic growths. It was evident that some calcareous matter existed, for the razor grated as it made sections. It was found microscopically that the tumour was a sarcoma, and in some places the connective tissue had undergone a further transformation into cartilage. The cartilage cells were of very large size, and the growth was undergoing mucoid change. Recurrence took place within six months, but the glands were not affected. No post-mortem was obtainable. The author in his paper remarks that Rindfleisch and Billroth speak of these tumours as though they were common. Gross had not been able to find an example. Sir A. Cooper and Cruveilhier also each recorded a case, but the evidence in the latter is a little faulty. Labbé and Coyne in their work[3] give an account of a case by M. Heurteux of Nantes. A woman of fifty-two had a hard tumour in the left breast, supposed to be scirrhus. Recurrence took place in eight months. One author concludes that cartilage is very rarely met with in the mamma, but it may form an innocent growth, as in Cooper's case, or else form part of a malignant tumour.

After Bowlby's case a second was communicated by the late Mr. Durham.[4] The tumour was a sarcoma, removed from the breast of a young woman of twenty-seven. There were hard bony masses in this remarkable growth, which consisted of well-developed osseous tissue with lacunæ and canaliculi. There were also scattered masses of cartilage and adenoid tissue with intra-cystic growths.

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[1] This case, with the effects of treatment, is published in full in the *Brit. Med. Journ.* for February 1897.

[2] *Path. Soc. Trans.* vol. xxxiii. p. 306.

[3] *Traité des Tumeurs bénignes du Sein.*

[4] *Path. Soc. Trans.* vol. xxxv. p. 378.

Another extraordinary case of sarcoma (?) of the breast, where the connective tissue had undergone further development into bone and cartilage, was removed by Mr. M'Kellar in St. Thomas's Hospital on 25th August 1885. The patient was seventy-three, the right breast was affected, and the tumour, the size of an orange, was of six years' growth. Not only did this growth contain cartilage, but also true bone with Haversian canals and concentric laminæ.

Quite recently another of these exceptional cases was thus reported in the *British Medical Journal* for 28th August 1897. The patient was a lady aged sixty-seven, under the care of St. Arnold of Lucerne. She had noticed in the spring of 1895 a swelling in the left breast, but her family doctor believed that it had already existed there for some time. Diagnosis at first was doubtful. The swelling grew steadily and became painful. After travelling the patient consulted a doctor at Zurich, and he diagnosed mammary abscess. As pus escaped he naturally believed, when he had made an incision, that his original opinion was correct. The swelling, however, increased, and fever set in, with extension of inflammation to the circumference of the breast. The patient became exhausted and slightly delirious. Lüning found the breast much swollen and surrounded with dilated veins and lymphatics. In the midst of the swelling was a cavity packed with iodoform gauze. Its walls were very firm, and it discharged fœtid pus. The axillary glands were not enlarged. Lysol was freely applied, but the temperature rose over 105°, and the patient seemed too weak for an operation. At the end of a week after she had been under Luning's care she seemed worse, and nothing appeared of any avail except to remove the focus of suppuration. The breast was therefore amputated and the wound thoroughly drained. Two days later the fever had disappeared. Two months after the operation the patient was in excellent health, and there was no sign of recurrence. The tumour was very tough and full of small tuberous masses. On examination St. Arnold found that it was a sarcoma containing bone and cartilage.

The following are excellent examples to prove that pure sarcoma may affect the glands.

A woman, aged fifty, had her left breast removed by Mr. Dobson in the Bristol General Hospital in January 1893. Ten months before she had received a blow upon it, and a month after a swelling appeared, which attained the size of an orange. Then she accidentally struck the breast again, when the tumour enlarged rapidly and the skin ulcerated. Four profuse hæmorrhages had taken place. The tumour was described as the size of a fœtal head, firm and bossed, and with the usual characters of malignant sarcoma. The nipple was retracted. In the axilla was a mass the size of a duck's egg. Microscopical examination showed the growth to be a round-celled sarcoma, and the same growth was found in an axillary gland. The patient died a month after operation, and round-celled sarcoma was found in the glands in the root of the neck. There were no growths in the internal organs.

A married woman, aged fifty, mother of twelve children, three years before admission noticed a hard lump in the right breast. No hereditary history of malignant disease. The patient was well nourished and of dark complexion. At the lower and outer part of the right breast was an elastic nodulated mass of new growth, the size of a turnip, movable on the subjacent parts, but adherent to the skin. One of its projecting nodules fluctuated ; the axillary glands were not obviously enlarged. The whole breast and pectoral sheath were removed, and the tumour proved to be a round-celled sarcoma. She was readmitted nine months later with recurrence in the scar, which was excised. A year afterwards she was again admitted with a large recurrent lump, the size of an orange, in the right axilla. This was dissected out, and was found to be encapsuled. Five months later she was again admitted with extensive axillary recurrence beyond operative interference.[1]

This case well illustrates (1) that round-celled sarcoma of the breast may be as malignant as any cancer; (2) that it may recur, like cancer, in the glands.

Sarcoma of the breast "secondary" to growths elsewhere seems as exceptional as in carcinoma.

In the year 1881 a middle-aged woman came to the Cambridge Hospital with a vascular sarcoma of the upper jaw of rapid growth. She drew attention to the fact that there were small tumours in either mamma, but the late Sir George Humphry, who examined them, took them to be fibro-adenomata, as they moved freely about. At the operation the patient, who was seated in a chair, took the ether very badly, and succumbed asphyxiated. The post-mortem revealed what was quite unknown to us during life, a large mediastinal tumour and a growth in the upper surface of the liver. This accounted for the fatal dyspnœa. The growths in the breast were encapsuled, and this accounted for their mobility, but they were soft and hæmorrhagic on section. All the tumours were round-celled sarcoma, and one can hardly doubt but that the primary disease was in the jaw.

A woman, aged thirty-three, without previous illness, was admitted into St. George's Hospital on 9th March 1894. She suffered from œdema of the left arm and fore-arm, which had been noticed for ten days, and was attributed to her carrying her child. By 15th March the œdema had gone, but the woman's strength did not improve ; she was sallow and had profuse night-sweats. Her temperature rose each night to about 101°, and continued to do so while she lived. An enlarged gland was discovered in front of the left sterno-mastoid. On 18th March she had pain with œdema in both legs. On 29th March an enlarged gland was found above the right clavicle, and subcutaneous nodules, adherent to the skin, were found over the left costal region. One of these nodules could be felt superficially over the right breast. It was hard and knobby, but did not infiltrate the mammary tissue. The woman died on 2nd May. Before her decease the liver had become enlarged, and fresh nodules had formed, while the lumps first noticed had increased in size. At the autopsy the primary focus of growth was found to be a mediastinal tumour. Dr. Rolleston kindly examined the secondary growth over the mamma, and believed it to be a sarcoma.

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[1] *Middlesex Hospital Reports* for 1886-1887.

A perusal of these cases will assist the surgeon to recognise and treat sarcomata of the mamma. As compared with cancer they are very exceptional. The classification and microscopical details of them are so confused, that I feel sure a re-examination of our older Museum specimens would result in a considerable alteration in some of the labels. The practical rule of surgery is very clear. In cases of rapidly-growing tumours, not fibro-adenomatous, very wide and early removal should be practised. In cases when recurrence takes place of tumours thought at the first removal to be fibro-adenomatous, the same rule applies. Recurrence may be the first warning of the disease. At the second operation, therefore, the most free excision possible should be carried out. A larger number of cases of sarcoma of the breast might easily have been collected, but it is hoped that those selected for this chapter will well illustrate the more important clinical features of the disease without wearisome reiteration.

CHAPTER VIII

GENERAL REMARKS UPON CARCINOMA OF THE BREAST

Its frequency — Pathological causation — Naked eye and chief microscopical appearances—Degenerations—Clinical course of the disease, with the causes of death—Spontaneous cures.

General Remarks. — Diseases of the breast undoubtedly obtain their greatest importance and significance, from the well-known tendency for cancer to occur in the mammary glands of the female. It is generally stated that cancer of the breast is more frequent than formerly. Like a number of other statements regarding this terrible malady, it is a question whether this one has foundation in hard facts, the increased recognition and diagnosis of the disease sufficiently accounting for the supposition.

In treating of this subject I prefer to sometimes use the term "scirrhus," for the clinical reason that most carcinomatous growths of the breast are hard and fibrous, and also the name is one which is largely employed throughout the profession. It must be clearly pointed out that some carcinomatous growths of the mamma are not in the least hard and fibrous, and do not contract. For them the term "scirrhus" is a misnomer. Hard, firm, or soft carcinoma are terms which may well be applied in practice.

Out of 1017 cases of disease of the breast collected from the Middlesex Hospital Reports between 1875 and 1893, 790, or over half, were those of primary cancer.

Out of the cases of breast disease collected by myself from the Records of St. George's Hospital for thirty years, about one-half were carcinomatous. Nunn estimated that carcinoma of the mamma was three times as common as cancer of the uterus. Sibley, in a total of 520 cases, finds 192 cancers of the breast, 156 of the uterus.[1] Baker, out of 500 cases, uterine cancer excepted, finds that 276 were cancer of the mamma.[2] It must be remembered that cancer, on account of its serious nature, is frequently admitted into hospitals, and this is not the case with other minor mammary maladies, as cysts and abscesses. Hence the proportions observed above are probably a little larger than is actually true. At the Middlesex Hospital, too, an unusually large proportion of these cases are admitted on account of the Cancer Institute there formed.

The importance of this subject is truly very great. Carcinoma of the breast is quite commonly taken as the example, for study of the origin and nature of this malady generally. In a work like the present, it is impossible to enter fully into the large and recondite subject of the origin of cancer, and it will only be alluded to briefly, to illustrate the subject in hand, and with the hope of giving due recognition to the labours of others.

The present time is a very opportune one for reviewing the whole matter of cancer of the breast. The introduction of antiseptics, the more extensive methods of operating, the increased facilities for diagnosis, have all worked changes in the modes of treatment of this disease, and in its results, of the utmost importance.

In the present chapter, the principal facts that are known relating to the causation and clinical progress of cancer of the breast will be shortly discussed.

The first two points to be demonstrated are that carcinoma attacks the breast of the female more frequently than that of the male, and the vast majority of cases occur between the ages of thirty-five and fifty. Thus—

In the male about	1	case occurred in	102.	Roger Williams.
	2	,,	98.	Paget.
	2	,,	102.	Gross.
	1	,,	200.	Mid. Hosp. Reports, 790 cases occurring between 1875 and 1893.
	3	,,	126.	Billroth.

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[1] *Med.-Chir. Trans.* vol. xliii.

[2] *Ibid.* vol. xlv.

For practical purposes, it may be considered that cancer of the breast is one hundred times as common in the female as in the male.[1] The St. George's Records for thirty years demonstrate that the proportion of male cases is exactly 1 per cent. Gross puts the average as high as 1 in 42, and it is obvious that experience of individual surgeons must differ. The broad fact that cancer of the breast in the female is vastly more common than in the male is undisputed, and is all that is needful for purposes of practice.

As regards the age at which cancer attacks the breast, there is a general consensus of opinion that the period of life between forty and fifty, or better, between thirty-five and fifty-five, is peculiarly liable to this disease.

Of 831 cases collected from the Middlesex Hospital Reports—

120	cases occurred	between 25 and 40.
273	,,	,, 40 ,, 50.
244	,,	,, 50 ,, 60.
194	,,	over the age of 60.
831		

Out of 400 cases collected by me from the Records of St. George's Hospital between the years 1865 and 1895, the ages were as follows :—

Between the ages of	25 and 40	there occurred	86	cases.
,, ,,	40 ,, 60	,,	240	,,
,, ,,	60 ,, over	,,	74	,,
			400	

The large number of cases in the twenty years of life after forty, comes out very strongly in these figures.

The youngest undoubted case of carcinoma was twenty-seven, the oldest seventy-seven. In connection with this it may be mentioned that Nunn, whose experience was very large, found his earliest case at the age of twenty-eight, his oldest at eighty-two.[2]

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[1] Bryant.

[2] *Diseases of the Breast*, pp. 21, 22.

In Bryant's table of 600 cases—

25	occurred	before	30.		
163	,,	between	31	and	40.
216	,,	,,	41	,,	50.
150	,,	,,	51	,,	60.
44	,,	,,	61	,,	70.
2	,,	over	70.		
600					

This authority states that he has seen cases as old as ninety-six and eighty-six years.

Birkett, writing in Holmes's *System of Surgery*, gives the following table:—

19	cases occurred	between	20	and	30.
100	,,	,,	30	,,	40.
193	,,	,,	40	,,	50.
97	,,	,,	50	,,	60.
34	,,	,,	60	,,	70.
6	,,	,,	70	,,	80.
7	,,	,,	80	,,	90.
2	,,	,,	90	,,	100.
458					

Gross states his experience as follows of 642 collected cases from various sources:—

18	cases occurred	between	20	and	30.
128	,,	,,	30	,,	40.
245	,,	,,	40	,,	50.
165	,,	,,	50	,,	60.
78	,,	,,	60	,,	70.
8	,,	,,	70	,,	80.
642					

The oldest cases I have seen personally are as follows:—A man of ninety-one with "duct cancer" of the left mamma. In 1897 I saw a patient of Dr. Gardner's of Amersham with undoubted hard cancer: she was eighty-three years of age.

The common age for the occurrence of carcinoma of the breast being thus sufficiently exemplified, it may be pointed out that the disease is rare at the extremes of life. Some of the youngest cases I have been able to ascertain are as follows:—

A servant girl twenty years of age died in the London Hospital with symmetrical carcinoma of the breasts and ovaries.[1]

Mr. Bryant kindly wrote in 1896, informing me he had removed a carcinoma of the breast from a young lady of twenty-one, who died afterwards of cancer of the lung.

Gross relates a case by Henry (Breslau) of carcinoma of the breast at the age of twenty-one. Coupland relates a case of cancer of both breasts and ovaries in a patient aged twenty-four. The extension of the disease in this case was frightfully rapid, and it seems to have been the youngest instance which had occurred in the clinical experience of the Middlesex Hospital. An instance of early carcinoma, which seems genuine, was related by Haycock.[2] Here the patient was a single woman twenty-two years of age. The reader will note that such cases as these are exceedingly rare.

I suspect that most of the cases of malignant disease of the breast related at comparatively early ages have been really sarcomata. This was probably the true nature of a mammary tumour reported as having been operated upon by the late Sir George Porter in the Meath Hospital, in a girl aged only thirteen. A large mammary tumour, removed by Barton from a girl aged twelve, was shown at a meeting of the Academy of Medicine of Ireland. This tumour was sarcomatous. The case reported by Bransby Cooper of "cancer" in the breast of a girl of fourteen is open to the same criticism, as is also an instance of rapidly fatal malignant disease of the mamma in a girl of eighteen, whose elder sister had just succumbed to a similar affection, reported in the *Edinburgh Medical Chirurgical Journal* for 1805.

Bryant, in his work, states that a specimen of mammary carcinoma exists in the Museum of St. Bartholomew's from a girl aged sixteen, but on investigation I am inclined to believe that this was really of a sarcomatous nature. Personally I have never seen an undoubted case of carcinoma of the breast under the age of twenty-five.

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[1] *London Hospital Reports*, vol. iii. p. 303.

[2] *Lancet*, 12th Sept. 1896.

As to the Breast most frequently affected.—An examination of the St. George's cases shows a slight preponderance in favour of the left side. Bryant as a result of his investigations finds the proportion nearly equal, while Gross says that cancer is more frequent in the right than in the left breast by 5 per cent. The difference is so small that the matter cannot be one of real importance.

Reviewing 306 cases of primary cancer from the St. Thomas's Hospital Reports, in 148 the right breast was affected, in 158 the left, being a slight preponderance in favour of the left side.

In the 400 St. George's cases, simultaneous carcinoma of both breasts occurred only eight times. From comparison with other authors, the proportion of 2 per cent would appear to be rather less than is usually the case. For instance, Gross found both breasts affected in about 5 per cent of his cases. The experience of different hospitals would doubtless show wide divergence in such investigations as these, the number of cases of cancer of both breasts admitted in any given year being largely a matter of chance.

The position in the breast of the growth is also liable to great variation. The upper and outer quadrant is a favourite locality. The nipple being near the centre of the gland, such statements as that the growth occurred below, above, to the outer or inner side of the nipple, have little significance. It is obvious that the majority of the tumours grow "near the nipple." A more important fact is to recollect that cancer may develop in any part, even the most outlying portions of the breast. I have repeatedly noticed that students fail to appreciate the clinical significance of this point. In a considerable number of cases the growth occurs deep to the nipple, or just above it, so that the well-known sign of retraction of that organ is manifest.

Importance will be laid in the subject of diagnosis upon the fact, that cancer is practically always single in the same breast, and if different nodules or tumours are felt, they are always connected by areas of infected tissue, though these may be difficult to feel.

It is quite certain that there is a widely spread area of infective epithelial proliferation around even the smallest cancer, and this not only extends peripherally, but also irregularly along the lymphatic channels. Thus nodules of cancer may be found which are apparently distinct from one another; but as they are connected by channels of lymphatic infection, such is not really the case. Mr. R. Johnson refers to a marked instance where the breast was excised for a cancerous tumour at the upper and outer quadrant. After removal two small nodules were found at its extreme sternal border, which were encapsuled carcinoma. He expressly states that the breast substance between was quite normal, so that this must be a case of a condition I believe to be exceedingly rare, where separate masses of cancer have formed in the same breast.[1] Even here I can hardly believe that such formations are separate outbreaks of cancer. I should be inclined to think that masses of infective cells have been swept along the lymphatics and accidentally arrested, forming local growth. Such a view would be quite compatible with the intervening mammary substance appearing quite healthy, but being really infected. In the St. George's cases there is a slight proclivity for the upper and outer, rather than the inner, aspect of the breast to be affected. But as the exact position of the growth is not always stated, my investigations cannot here be regarded as quite complete.

Cancer originating in Axillary Mammæ.—As in the case of fibro-adenomata, cancers arising in distant outlying lobules of mammary tissue are stated to originate in accessory glands. Some writers, like Mr. Williams, place the percentage of cancers which thus form as very high. The point is a difficult one to definitely settle. In the St. George's cases I could not be clear that more than 1 per cent originated in accessory glands, the cancer being so far from the breast that it seemed hardly possible that it could form in any part of it. A good illustrative case of cancer growing in an axillary mamma, and producing secondary nodules of the skin, is as follows:—

A woman, aged fifty-four, was admitted into St. George's Hospital on 16th August 1877. She was quite well until four months before admission, when a small lump the size of a pea appeared in the left axilla, quite apart from the breast. It slowly increased in size, and was opened for an abscess, but nothing but blood exuded. After this it continued to increase very rapidly, and the arm became painful and swollen. A few days after the swelling in the axilla was thus opened, the skin round it became dusky-red and hard like leather, and here and there "warty lumps" appeared. The pain now became very great and the patient weak and thin. On her admission there was a fungating mass of scirrhus in the left axilla, quite apart from the mamma, the size of a hen's egg. The skin over the left breast, left side, as far down as the last rib, was dusky-red and indurated. All around in the cellular tissue could be felt innumerable hard nodules about the size of a pea. The skin over some appeared free, over others reddened and adherent. The skin of the left side of the neck also contained three tumours. As the case progressed the arm became very œdematous, the pains more and more severe. Numerous ulcers appeared over the nodules, and she died of exhaustion and sepsis on 24th November 1877.

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[1] *Lancet*, vol. i. 1894, p. 1548.

A patient, whose age is not stated, was under the late Sir Prescott Hewett's care in St. George's Hospital in April 1868. Eight months before admission she had noticed a lump the size of an almond in the right axilla, and since then three or four more tumours have made their appearance. It was especially noted that the tumours were perfectly distinct from the breast. The primary growth and glands were removed. The tumour was the size of a "cob-nut," and was found to be definitely of a "scirrhous" nature and quite separate from the breast.

Paul of Liverpool relates a most excellent example of primary cancer of an axillary mamma. The tumour was in the centre of the right axilla and was "a typical-looking scirrhous carcinoma." Five months afterwards the growth recurred, with extensive internal deposits. The paper contains an excellent account of the minute structure of these accessory glands. He inclines to the view that they are closely allied to sweat-glands.[1]

In the London Hospital Museum[2] is a specimen of carcinoma of an axillary mamma. It was removed from the axilla of a young woman aged eighteen by Mr. M'Carthy, but no details of the microscopical examination are given.

A very important position for cancer to occur, yet little noticed by surgical writers, is beneath the mamma, at the furrow between the breast and the thorax. A little hard ulcer forms about the size of a sixpence; it is covered by a scab and looks very insignificant, yet there is no pectoral

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[1] *Path. Soc. Trans.* vol. xlvi. p. 153.

[2] No. 2334A.

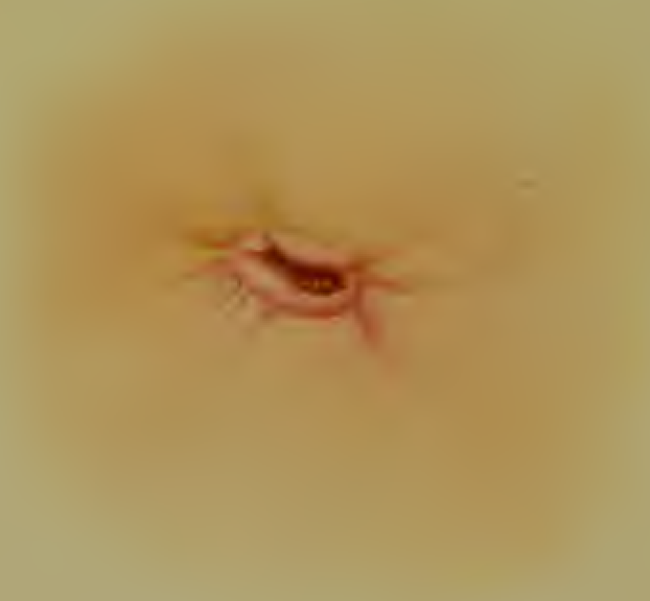

PLATE XI.

Hard carcinoma of a peripheral lobule of the mamma, in the walls of the thorax below the breast. The intercostal muscles were infiltrated in this case, and recurrence took place in the pleura.

To face p

beneath it, and consequently the thoracic parietes are very early and seriously implicated. The following case well illustrates this variety of carcinoma.

Carcinoma at the Thoraco-Mammary Fold (Peripheral Scirrhus).—A woman, aged seventy-seven, was admitted into St. George's Hospital on 3rd October 1894. For three months she has noticed a growth beneath the left breast. It began as a "pimple," which ulcerated. There is a small ulceration in the skin, just below and internal to the left mamma, in the thoraco-mammary sulcus. The ulcer is about the size of the nail of the little finger. Round the ulceration the skin is hard and indurated for a considerable area. The growth is not apparently adherent to the deeper parts, and the breast itself seems not affected. No glands are to be felt in the axilla. The growth and breast were removed, and the intercostal muscle beneath was seriously infiltrated. Microscopically the growth proved to be spheroidal carcinoma, and some mammary tissue was also present. This is worthy of note, since the appearance of epithelioma was very closely simulated during life. There can be little doubt that cases like these really commence in outlying lobules of mammary gland tissue, and early affect the skin.

Social Condition.—Owing to the age at which cancer occurs, the majority of the women are, or have been, married. Morant Baker found that 77 per cent of his cases were, or had been, married. Gross calculates that about 88 per cent were married, 12 per cent single; while Bryant, who investigated the large number of 600 cases, found 80 per cent married, 20 per cent single.

In 400 cases at St. George's Hospital 330 were, or had been, married, and only 70 were single.

The presence or absence of menstruation seems to have little direct bearing.

As regards condition of life, the disease makes no distinction between rich and poor. There can be no doubt that cancer of the breast is more common in some localities than others, but then it will be found that these districts have a notoriety for cancer generally, and are marked on maps devoted to the subject as being cancer districts.

I have often thought that the statistics as to the frequency of cancer in certain districts are liable to various sources of error. For instance, cancer being a disease of advanced life, will always be prevalent in districts where many old persons live, as the suburbs of large towns, to which persons in easy circumstances retire to pass the evening of their lives. This may also account for the supposition that cancer is more common in the "well-to-do" classes. Also large workhouses or places of refuge, where the victims of incurable cancer die, will of necessity raise the death-rate from this cause in certain localities.

Influence of Antecedents, Inflammatory or other Conditions, in producing Cancer.—We here enter upon a most interesting subject, and one that is, in my judgment, quite impossible to answer with the certainty that its importance warrants. Judging by the pathological history of cancers growing in other parts, one would feel unhesitatingly ready to assert that irritation is the predisposing cause, *par excellence*, of cancer of the breast. If cancer of the tongue and lips is caused by the irritation of pipes and smoking, if cancer of the œsophagus and intestines occur at the points of greatest friction, why should not cancer of the breast be brought about by epithelial irritation also? This view has much to commend it, and for long has excited the attention and received the support of the best pathologists. I fear, however, that the statistical method, as applied to the origin of cancer in past mastitis, is peculiarly delusive. Bryant found that out of 360 cases mastitis had occurred at some antecedent period in 80. Gross found evidence of antecedent mastitis in 71 cases out of 365. In only 30 did an induration remain from which carcinoma originated. He estimates that the formations of chronic mastitis may remain quiescent for fourteen years, and yet originate carcinoma.

Cheyne states, and his evidence is very important, that, after carefully considering the question, he believes that not more than 25 or 30 per cent of the cases can be proved to have had pre-cancerous inflammatory conditions, or such assumed predisposing causes as mental states and hereditary predisposition. This leaves some 70 per cent of the cases unaccounted for.[1]

In the St. George's cases there was a distinct antecedent history of breast trouble, such as sore nipples and inability to suckle, or inflammatory disturbances in not more than 10 per cent. It is only right to allow, however, that this question had not been investigated in every instance, or with that rigid cross-examination which is needful to elicit anything like accuracy in the statements of patients of the hospital class. I rejected also any case in which the evidence of past inflammation, and the origin of the carcinoma in the site of it, was not very certain.

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[1] *Med. Soc. Trans.* vol. xix. p. 137.

It is especially from pathological affinity that we deem it likely that carcinoma of the breast originates in irritative epithelial proliferation of old inflammatory foci. No mention need here be made of the origin of cancer in old scars and degenerated structures; it is as well established as anything in the clinical history of the disease. Now it is impossible to estimate, in my judgment, with even an approach to accuracy, the number of women who do, or do not, bear in their breasts areas of damaged tissues theoretically capable of cancerous degeneration. The obvious mistake seems to have been committed in estimating this matter, that the only reliable evidence of old mastitis consists of masses, which the patient or surgeon can actually feel, or distinct histories or actual scars of old abscesses and inflammations. Surely, if we allow that cancer of the breast commences in such tissue, we must allow that the disease may also originate in the smallest area of it, which may vary from the size of a pea to microscopical dimensions, which though hidden from appreciation is none the less a potent cause of danger. Consider the life-history of mammary-gland tissue, its various and frequent epithelial changes, its tendency to duct obstruction, to slight inflammations, to injuries, to vascular engorgements. It is as certain as argument can make it, that no woman arrives at the age of forty-five without bearing in her degenerated mamma one or more foci of damaged tissue, too small to be seen or felt, which, if the theory that cancer starts from such tissue be true, must be ready for the malady to originate in it. In other words, few women arrive at the age of fifty without having, as it were, some small area of tissues of their mammary gland prepared for cancer invasion, whether parasitic or otherwise.

Beadles,[1] in an important paper, well worthy of study in connection with this part of the subject, discusses the morbid changes found in breasts, the site of carcinoma. His observations are founded on the examination of 100 mammæ at the Brompton Cancer Hospital. He observed that breasts in which carcinomata occur are never in a normal state. He finds not only proliferative changes in the acini, but also in the stroma, and cysts are exceedingly common. Our minds must be kept open as to how far the primary growth causes these conditions, and how far these conditions are the cause of, or favour, the primary growth. The retrogressive appearances incidental to age must also receive consideration.

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[1] *Trans. Path. Soc.* 1892.

Next, we may refer to the clinical and pathological confusion that must always exist in the minds of those who are conscious of the great difficulty of the subject, between cancer in its early stage and chronic inflammatory changes involving the epithelium. How often have we seen a case marked by a small area of indurated tissue in the breast, when, without watching progress, it is impossible to say whether it is cancerous or inflammatory? Does the microscope certainly differentiate between early cancerous change and the epithelial proliferation which accompanies chronic inflammatory infiltration?

I hold that these and similar considerations must invalidate the reduction to hard and fast percentages of the origin of cancer in chronic indurations and old inflammations. The matter is far too complicated a one for this. We can only say that, judging from what we know of the association of cancer with chronic inflammations and irritation about such parts as the tongue or os uteri, it is justifiable to assume that the frequency of cancer of the breast is to be explained in the same manner.

Considering the number of causes in advancing life by which irritative proliferation and damage to the mammary epithelium is brought about, it is probable that only a minority of women prepared, as it were, for cancer suffer from the disease; and I feel sure that the removal of breasts for inflammatory disorders of a chronic nature has often been much abused.

Personally, giving my opinion with all diffidence, I have serious doubts as to the generally-received connection between cancer and chronic inflammations of the breast substance itself. If we look for analogous conditions through the body, we are struck by the fact that it is irritation of surface epithelium that is so generally followed by cancer. Common examples are cancers of the gall bladder from the fretting of a stone, irritations of the surface of the tongue, of the os uteri, of the glans penis. I do not know of any instance of interstitial inflammations of glands being followed by cancer growth. We may inquire how it is that the epididymis is not more often affected, considering the large number of men who carry in this locality areas of chronic inflammation. Yet primary carcinoma of this part is a very rare malady. I have never seen carcinoma of the liver develop in consequence of cirrhosis of the liver, or in the areas of indurated tissue left by gummatous disease, or in chronically inflamed kidneys.[1]

It is otherwise with constant irritation of the larger milk-ducts. These are really surface irritations, or infections for those who hold the latter theory. I should, therefore, look upon constant and abiding irritation of the nipple in an elderly woman, as a far more important pre-cancerous condition than an induration deep in the breast; and now that we are aware that a carcinoma originating in the ducts may, in the mamma, take on the type of a spheroidal-celled growth, it seems likely enough that more carcinomata are of true duct origin than has been hitherto thought likely.

I have already dealt at some length on the changes occurring in chronic eczema of the nipple. I have endeavoured to distinguish between chronic eczema of an ordinary nature, and that infiltration of the skin which characterises the affection known as malignant dermatitis. It seems generally agreed that this condition is a precursor of cancer, but it is by no means a frequent one, and may long exist without cancerous change. On referring to p. 155 it will be seen how rare this affection really is, and how it is not by any means a certain precursor of cancer. In reference to this point the valuable paper by Bowlby[1] may well be studied.

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[1] Hanot and others have described carcinoma as originating in cirrhosis of the liver. It must be very rare.

Every surgeon will know of instances where carcinoma has occurred on the site of old abscesses, or beneath "sore nipples," and pages of illustrative cases might easily be collected. The following will help to impress a very important point upon the mind of the reader.

This case is a remarkable one, for cancer seems to have engrafted itself upon a mamma, the site of an old galactocele. A spare, anxious-looking lady, a widow, consulted me on 13th October 1896, and gave the following history: About twenty years before, she had a tumour of the right mamma which formed during lactation, and increased to the size of a large orange. By the advice of Paget this was opened, and a quantity of substance "like cheese" was evacuated. Her attendants told her it was a "milk tumour," and would never return. This opinion was verified, and the breast has been quite well since. Nine years ago an exactly similar swelling formed in connection with lactation in the left breast. It was not so large, and she was advised "to rub it away" with liniments. She has kept up constant frictions of this tumour ever since, but twelve months ago she noticed it getting more painful and harder. On examination, the left mamma was the site of well-marked scirrhus, tending to assume the atrophic form. The nipple was retracted, and three slightly pigmented, disc-shaped nodules of carcinoma were seen in the skin over the breast. No glands were apparently affected, but the mass was rather fixed to the pectoral muscle. There were no signs of visceral implication. The evidence of left galactocele is not complete, but the case is a striking one, as showing the influence of long irritation in association with the development of cancer. The patient declined operation, and placed herself under the care of an irregular practitioner, who doubtless reaped reputation from the natural atrophy of the cancer.

In 1897 I saw, strangely enough, three cases where carcinoma had developed beneath the scar of old abscess. One woman was forty-five years of age, and her abscess had occurred fifteen years before. The tumour was a well-marked duct carcinoma of the hard type. It may be taken as a good practical rule that, if swelling and induration occurs in the site of an old mammary abscess, this will either be the sign of a fresh abscess arising from long latent organisms, or a growth of a cystic or malignant character. Early exploration is indicated in either case.

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[1] *Med.-Chir. Trans.* vol. lxxiv.

Traumatism.—It is a well-known clinical fact that blows and squeezes of various organs, and of various parts, are followed by the development of malignant growths. This is true of such parts as the bones and testis; it is equally true of the breast, especially of the male breast. Instances of the development of tumours after injuries will be found scattered through the illustrative cases in this work. It must be remembered that the breast is especially exposed to injuries of all kinds. Hence if a woman finds a tumour of the part, she is only too likely to attribute it to some injury, which may have nothing to do with its formation. In the St. George's cases, the origin of carcinoma seem directly attributable to a definite blow or injury in 25 out of the 400 cases. All cases were rejected, unless where there was a very definite history of injury, with the rapid formation of the tumour afterwards. The accidents seem to have been a blow from a fist or a kick, injury from a child's head, or a fall against some projecting hard substance, as the corner of a "dresser" or table.

We must next touch upon the vexed question as to the actual origin of carcinoma of the breast. Does it commence in the epithelial cells? If so, what is the cause of the cellular proliferation? Is it a mere error of growth, or is there some living organism which produces the change, or some chemical material which acts in a like manner? Or, shall we believe that the disease is of constitutional origin, and that the damage or irritation of epithelial structures merely renders them prone to be attacked by a disease already present, but not manifest?

It is generally agreed that cancer takes its origin from epithelial cells, and that the earliest changes are a morbid epithelial proliferation, the cells infiltrating the connective-tissue spaces, and hence the lymphatic channels and glands. This view, strongly held and promulgated by Thiersch and Waldeyer between 1865 and 1872, has gained ground, so that this hypothesis is generally received. It cannot be denied that it is a useful one for working purposes. Virchow, writing about the same time, favoured the opinion that the new growths, including carcinoma, originated from connective tissue. Cornil and Ranvier (in their *Manuel d'Histologie pathologique*), on the whole, support the views of Virchow.

At the risk of criticism, I would affirm my belief that this question is not even now definitely settled. I believe it to be impossible to certainly deny that the connective-tissue cells do not share in the proliferative process so remarkable in cancer, even if the disease does not commence in them. The definite lines drawn between cancers and some forms of sarcoma, are hardly becoming more definite as knowledge increases. In structures like the breast, where epithelial and connective-tissue elements are so mixed and interwoven, the difficulty of definitely settling a point of this nature is very great. Many growths, both cancer and sarcoma in their very early beginnings, may be mere patches of ill-defined tissue, with confused arrangements of cells of an embryonic type; and it is only as the growth further develops that a more definite structure is found. I may here mention a case which bears very forcibly upon this point.

In the year 1888 a single lady of about forty was under my care, suffering from an abdominal tumour pronounced by many authorities to be fibroid in nature. Removal was considered dangerous, and the patient determined not to be operated upon. The true nature of this tumour was never discovered. On 4th December an ill-defined induration, the size of a small bean, was observed, and removed from the sternal margin of the right mamma. This had been noticed for a few weeks, and was speedily operated upon, as it seemed to have definitely increased, and its true nature was most important to clearly elucidate. The pathologist who examined this specimen is undoubtedly one of the most learned and accurate in this country. He pronounced it to be undoubtedly a sarcoma. The cells indeed were oval and spindle-celled, and arranged like sarcoma; and, speaking with the more limited histological knowledge that I possessed, I should have said that the specimen was as marked an example of "large, spindle-celled sarcoma" as I had ever seen. Recurrence in the small scar took place, and the whole breast was removed in August 1889. The disease was then typical spheroidal carcinoma, of which the patient ultimately died.

This was the earliest specimen of carcinoma I have ever had the opportunity of examining, the focus of growth being hardly larger than a "split pea." The case goes to prove that in its very commencement, carcinoma may be of such a dubious type, that a most accurate and careful pathologist may be at a loss to assign to it its true classification, epithelial proliferation being merged or lost in embryonic cells.

Among hospital patients, it is rare for malignant growths of the breast to be very early examined; and the limitation of the powers of the microscope in deciding points like these is perhaps hardly enough generally appreciated. Of one thing we may be certain, that the epithelial cells take a marked and predominant part in the growth of a carcinoma, even if they do not entirely originate and form it; and I am aware that general pathological opinion pronounces in favour of the growth being entirely epithelial. With these reservations, we will grant that a morbid epithelial growth is the marked feature of carcinoma of the breast. We are next met by the query, What is the primary cause of the epithelial activity? In other words, What is the cause of cancer? The arguments for and against cancer being a parasitic disorder may here shortly be stated. One school of pathologists looks upon cancer as essentially an error and abnormality of growth, the other believes that the growth is directly due to the presence of an organism exciting cellular proliferation by its presence.

The main arguments in favour of cancer being due to a parasite are as follows:—

(1) That the dissemination of the disease from a focus through the body, especially by means of the lymphatics, is in favour of a parasitic element.

(2) That in cancer of the breast parasitic protozoa are found.

(3) That in certain localities cancer is endemic, and that even in certain houses many successive inmates have died of cancer.

The arguments adduced against the parasitic origin of cancer may thus briefly be presented:—

(1) The dissemination of the disease by means of cellular elements, may be entirely due to the power cells have, under certain circumstances, of inducing growth in other cells, or of self-proliferation. A striking proof of this is seen in the "secondary" tumours of the thyroid gland, which reproduce thyroid gland structure, and in cancer of the liver, "secondary" to rectal carcinoma. The presence of epithelial cells in the

secondary growths of cancer of the breast in the lymphatic glands is, however, no insuperable argument against the parasitic theory, for the presence of organisms within the cells themselves may be the actual cause of their proliferation and dissemination.

(2) The parasitic protozoa described are normally found in the liver and intestines of a large number of animals, where they originate no true tumour growths, but occasionally cysts or dilatation of ducts, or inflammatory hypertrophies. In the bile-ducts of rabbits swarms of these bodies may be seen, and papillary villous-like growths are associated with them. The temptation to liken these to the formations in duct papilloma, or the villous variety of duct cancer, is very great.

(3) While one class of observers describe these bodies as universally occurring in cancer, another class, equally able and conscientious, deny their existence; and attribute their appearance to cellular changes, cell inclusions, and the like.

(4) That cancer is not inoculable experimentally, and that, so far as the so-called cancer parasitic bodies are concerned, they have never been isolated and cultivated, and the disease reproduced by their inoculation. This is the "crux" of the whole matter, and until this is accomplished most observers prefer to suspend their judgment.

Our knowledge of the why and wherefore of cellular functions is strikingly limited. Why should the cells of one gland select certain chemical constituents from the blood, as the saliva, bile, or semen? Again, we are completely ignorant of the cause of general cellular death and decay in the phenomena of old age. So varied are the powers and functions of the substance we term protoplasm, and so little do we understand them, that we need not be surprised at our small knowledge of the nature of tumour growths.

The distinctions between malignant new growths, between sarcoma and cancer, are not as defined as one would generally suppose. Clinically, malignant tumours are composed of cells, which have entirely, or in a very great part, merged all other functions in that of reproduction, and this therefore is excessive.

Paget, in his Morton Lecture for 1887, overestimated the likeness to cancer of such diseases as syphilis, tubercle, and glanders. It is impossible to conceive any disease more uncommunicable than carcinoma. Cancer has been known for at least two thousand years. During that period hundreds of operations have been performed, and surgeons and nurses by the hundreds have come in contact with cancerous sores and discharges. Not a single instance of contracting the disease has been known. How widely different is the case in syphilis, tubercle, or glanders.

In the same patient, however, cancer may be acquired by some part being long in contact with a carcinomatous tumour. Thus it may be carried from one lip to the other, or from one labium to the other, or cancer may be found scattered about the peritoneum in cases of cancer of the ovary and the like. Mr. Cripps[1] relates a most important and interesting case illustrating the possibility of auto-infection of epithelial structures by cancer.

> A woman who had a large, open, cancerous ulcer of the breast and thorax, kept her left arm bent, and in constant contact with the disease. Consequently, the skin of the arm became the seat "of a cancerous ulcer several inches in diameter."

In the same way, epithelial cancer has been engrafted from one side of the vagina to the other; and the dissemination of carcinoma about the peritoneum is well known. Auto-infection of carcinoma therefore in favourable circumstances is possible, but even this is not common. A similar case was reported by Mr. Shaw of the Middlesex Hospital. Here the skin of the abdomen became cancerous from contact with a pendulous cancerous mamma.

Secondary cancers consist of cells exactly like their predecessors, and the structure of the growth is identical. This is difficult to explain, unless each form of cancer has a special parasite, or the parasite resides within the cells stimulating them to growth.

How easily do epithelial cells take root and grow on congenial soil, as in skin grafting, yet no parasitic element is here at work!

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[1] *Path. Soc. Trans.* vol. xxxii

Cancers and sarcomata are carried from place to place by cells or nuclei detached from the primary growth. Ballance and Shattock, in their experimental research upon the inoculability of cancer, say, "What is true of tubercle is almost certainly true of cancer." May not this statement be questioned? Tubercle is easily inoculable. The eating of tuberculous meat has been followed by tubercle, and so has the swallowing of tuberculous milk. Malignant tumours are alkaline, not acid in reaction if freshly examined; and the cachexia of late cancer is due to sepsis and the decomposition of cellular products, and the ordinary pathogenic organisms. The above arguments are largely quoted from some excellent papers[1] by Barwell, and he proceeds to classify the experiments on the communicability of cancer as follows:—

(1) "From a diseased human being to a healthy one. Alibert in 1808 inoculated three students and himself with the succus of mammary cancer. They did not suffer from their devotion to science!"

(2) "From a diseased part to a healthy part of the same subject. This has a comparatively large percentage of success. Five such experiments have come under observation, and four of these succeeded." I may here remark that, for obvious reasons, such experimental proceedings as the introduction of a piece of cancerous mamma into the opposite breast are not likely to be often repeated, at least in this country. Mr. Barwell goes on to point out, that the success is at least as likely to be due to simple proliferation of the cancer cells as to a microbe.

This class of experiments, however, goes far to prove that the presence of malignancy is an indication that, in an individual suffering from cancer, his tissues are fitted for the reception and maintenance of such a neoplasm. Thus morsels of cancer falling about the peritoneum of a cancerous individual take root and grow; whereas in the experiments of Duplay and Cazin, implantation of cancer into the peritoneum of fifty-four rats failed entirely.

The failure of inoculation experiments have been explained by supposing that the parasite of cancer can only sporulate externally, and only outside the body assume an infecting condition. Mr. Shattock spoke of this view in his most interesting Morton Lecture, and it is well known that there are conditions analogous to this in the life-history of several intestinal parasites. But if a metamorphosis of the cancer parasite outside the body be needful, how does it fit in with the characteristics quoted as proofs of the parasitic nature of malignancy? The involvement of glands, the production of nodules, contact infection, peritoneal infection,—these manifestations could not be affected by a parasite which had to go outside the body to assume infective properties.

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[1] *Lancet*, 1894, vol. i.

In the Morton Lecture for 1894, it was mentioned that Ballance and Shattock introduced portions of growths into sand moistened with beef infusion, and found certain moving amœbæ, which might be the young form of the cancer parasite outside the body. Proof of this is yet to be obtained.

Sims Woodhead, in his Morton Lecture for 1892, allows that the obstinate refusal of carcinoma to be transferred from a diseased to a healthy individual would be fatal to the parasitic theory, were it not for the possible explanation that the supposed cancer parasites have been implanted into tissues whose cells are capable of destroying them. This explanation is very ingenious, but perhaps inadequate, as, for example, when cancer is engrafted in the peritoneum of animals, a situation where all parasitic elements would be likely to flourish.

Again, the supporters of the parasitic theory point out that, if the cancer parasite is not a bacterium, then it is not surprising that the results of bacteriological investigation regarding it are negative. If it is of the nature of one of the protozoa, then the ordinary staining and cultivation methods fail. But this does not disprove the argument that the parasite of cancer exists, and yet does not admit of cultivation or staining by the methods now known to us.

Inoculation and transplantation of cancer from man to one of the lower animals has seldom been successful. Experiments of successfully inoculating mice are to be looked upon with suspicion.

Inoculation or transplantation from animal to animal of the same species has had a certain number of successes. The failures are almost innumerable. Barwell quotes five such experiments, which seem to be undoubted and reliable.

Inoculation of cancer from one animal to another of a different species has always failed.

In his last paper, Mr. Barwell gives a very full account of the observations of supposed parasites embedded in the cells of cancer. The first discovery of these bodies is attributed to Malassez in 1889. He goes on to point out the great difficulty of the subject, and the ease with which the various kinds of endogenous cell-proliferations may be mistaken for parasites. The names of a number of eminent microscopists are given, who quite deny the interpretations of those who uphold the parasitic theory. The methods of preparations and staining seem in no way agreed upon. Spores of the supposed parasites have never been seen.

I may sum up by declaring that no clear evidence as yet has been produced of the parasitic nature of cancer, but it behoves us to keep an open mind upon a subject fraught with such importance.

A perusal of the foregoing remarks will show the reader that, as regards cancer of the breast, our knowledge of its causation is at present merely a matter of conjecture. If, as is likely, epithelial irritation be a strong predisposing cause, the functions and changes of the mammary gland will ever necessitate this cause being present. Having carefully considered the evidence for and against parasiticism, I merely declare myself an agnostic: and to positively assert or uphold either theory of the origin of carcinoma of the breast is, in the present state of our knowledge, not advisable. If a parasite exists, such a parasite must differ in its life-history, and reaction to staining agents, from those with which experts are at present acquainted.[1]

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[1] "It appears, in the light of our present knowledge, that if an organism be the cause of cancer, it should be amœboid and spore-producing, spending a part of its life in damp earth and a part in epithelial cells. It should be extremely tenacious of life, and must have a long resting-period, though its spore-bearing time may be very short. Its effect upon epithelial cells would be rather to stimulate them and cause their amitotic division, than to lead to their destruction; and this irritation of the cells, might perhaps serve the secondary purpose of providing the complex proteid food necessary for the growth of the organism" (Power, *Brit. Med. Journ.* 27th April 1895).

We now come to shortly consider the hereditary history of cancer. Here, as usual, we find the greatest diversity of opinion. This subject has been treated in the most extraordinary manner. In most of the collected tables, when hereditary disease is said to exist, uncles, aunts, and even cousins and grandparents are not excluded. The matter is well summed up by Mr. Cripps,[1] and he well shows how fallacious arguments of the hereditary frequency of cancer are apt to be, even when obtained from the highest sources.

Of 168 cases of cancer in St. Bartholomew's Hospital, between June 1869 and October 1878, where the history of cancer in the parents seemed reliable, 12 parents among 336 had the disease, or one case in 28.

According to Baker's statistical papers from Sir James Paget's practice, the proportion is 1 in 24.

Taking the Registrar-General's reports for ten years, there are 81,699 deaths from cancer in persons over twenty years of age out of 2,379,622, or 1 in 29. That is to say, that the death-rate from cancer is about equal in the whole community, to the death-rate from cancer in the parents of those who are cancerous.

The following table illustrates some important percentages of "hereditary" history for those who lay stress on such researches.

Nunn	found	29	per cent	of cases.
Paget	,,	33	,,	,,
Gross	,,	9·7	,,	,,
Bryant	,,	12	,,	,,

The result of the collective inquiry into the hereditary history of malignant disease is published in the *British Medical Journal* for 1887. This important paper is hardly enough known or quoted. A careful study of it will go far to convert the sceptical towards the hereditary doctrine. Some of the cases are most striking, and, as Butlin has pointed out, the relationship is often on one side. I may add that the same organ, as the breast or uterus, is frequently attacked from one relative to the other.

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[1] *St. Bartholomew's Hospital Reports*, vol. xiv.

In the *Middlesex Hospital Reports,* between 1882 and 1889, much information will be found on the hereditary history of cancer. Generally speaking, the mammary cases showed hereditary history in about 24 per cent, but the inquiry is not limited to near relations.

The ordinary question, "Have you lost any relatives from cancer?" is not likely to be answered accurately by a hospital patient, and prevarication regarding such a matter is only too likely among the better classes.[1]

The truth seems to be midway between the two extremes. Any marked structural details, as colour of eyes, hair, or that peculiar condition which predisposes to tuberculosis, is certainly hereditary. So are such affections as hæmophilia, multiple fingers or toes, and especially such growths as multiple sebaceous cysts, and multiple exostoses. A single exostosis, a single cyst, rarely, if ever, presents a history of like affections in the parents. On the other hand, in a large number of cases of multiple wens on the scalp, a distinct family history is usually to be obtained.[2] In like manner, a tendency to cancer growth may, in some few cases, be sufficiently pronounced to become hereditary; and it is only in this way that we can explain those exceptional but truly remarkable instances, where members of one family are pursued by malignant growths with relentless certainty. Such instances come under the personal cognisance of many practitioners of experience, and the occurrence of them is beyond doubt. In such individuals one can hardly dispute that there is a condition, which either renders the tissues vulnerable to a particular organism or virus, or transmits the virus, or a tendency to riotous error in cellular growth.

Instances of what I mean by the development of a tendency in families to the development of cancerous growths, or to a vulnerability of tissue to such growths, may be quoted as follows:—

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[1] "If, therefore, the 'statistics' collector is content to take and record the first answer that he gets to the question, 'Have any of your relatives had cancer?' the result of his inquiries will, I believe, be worth far less than the paper and ink which he consumes" (Mr. J. Hutchinson, *Archives of Surgery,* p. 49, January 1896).

[2] I am acquainted with a lady whose scalp is covered with "wens." Her mother and maternal grandmother both suffered similarly. Such cases are common.

A woman, aged fifty, died of cancer of the left breast. She had six daughters, five of whom suffered from cancer, as follows: The first died of cancer of the left breast at fifty; the third was operated upon at the age of fifty-four, for cancer of the left breast; the fourth, aged forty-nine, has been twice operated upon for carcinoma of the left mamma; the fifth died at about forty years of age from erysipelas, five weeks after removal of the left breast for cancer! We have thus six members of one family suffering from cancer of the left breast. In this striking account, mention is also made that in two of the cases recurrence after operation was delayed for nine years and more.[1]

A grandfather died of cancer of the lip. The son had cancer of the breast. Two of his sisters had cancer of the breast. A daughter of one of the ladies had cancer of the breast. A daughter of the gentleman had cancer of the breast. There was good reason to believe that other members of the family were affected and concealed the disease.[2]

A lady died with cancer of the stomach, one of her daughters died with cancer of the stomach, another died with cancer of the breast; and of her grandchildren two died with cancer of the breast, two of cancer of the uterus, one of cancer of the bladder, one of cancer of the axillary glands, one of cancer of the stomach, one of cancer of the rectum.[3] Here the absence of transmission of locality of the disease is very marked.

The late Mr. Sibley related a case where a mother and her five daughters all died of cancer of the left breast.

It is reported that Napoleon the First, his father, mother, and two sisters, died of cancer of the stomach; the facts are not undoubted.

There is a certain noble family in this country, the members of which have succumbed to carcinoma almost without exception for two generations. They have not lived in the same house. Their medical attendants are well aware of the facts.

Every surgeon of large experience in the diseases and secrets of private families can relate instances of this kind. They are striking and undoubted, and could easily be multiplied. I should look upon the subject in much the same light as one is disposed to regard tubercle or insanity. The involvement of one member of a family goes for little or nothing, but the affection of many is always significant, and must, in my judgment, be taken into diagnostic consideration. It may be remarked that it is also possible to quote very striking instances of many persons in a family dying of cancer, whose progenitors have not had the disease. Such may fairly be set down against those striking cases of "cancer families" as just illustrated. A useful illustration of this is given by Roper of Exeter.[1]

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[1] Shaw, *Lancet*, 3rd May 1856.

[2] Warren, *Surgical Observations on Tumours*, p. 281.

[3] Paget, *Path. Soc. Trans.* vol. xxv.

> Mr. D. was one of twenty-two children. He married. Neither himself, nor his wife, nor any of this extensive family, suffered from cancer. Seven children were born of the marriage, and of those no fewer than six died of cancer, the females of cancer of the breast.

In such cases as these, the theory of an infective element or an infected locality at once suggests itself to the mind. The believer in the hereditary theory would reply, that the progenitor may not have lived long enough to exhibit the disease, which would ultimately have attacked him.

Cancer being so essentially a malady of old age, a father or mother may die of various diseases or accidents before the cancerous change manifests itself. They may thus transmit the tendency to their offspring, without the latter being aware of it. It is only right to allow, that the hereditary transmission of cancer has been held by some of the most sensible and illustrious men in the profession. Sir William Jenner, in declaring himself a believer in the hereditary theory, relates how a father came to see him with cancer of the tongue, while the patient's child had already died at an early age with disseminated cancer.[2]

It has often seemed to me that we shall never explain the occurrence, mode of growth, still less the treatment of cancer and of tumours generally, until we know more of the mysteries which surround the functions of the protoplasm of cells.

We know that the union of microscopic cells in the germinal spot, results in the rapid development of masses of cells, arranged in layers and folds of the most ingenious and apposite nature, ending in the perfection of structures of a perfect fœtus and the evolvement of a new being! No one has suggested a parasitic element in the rapid cell-growth which here occurs, or in the masses of reproductive cells which repair injury, and which are especially found in the reproduction of limbs in the crustaceans. We are aware that an individual originating from a microscopical element, will represent his progenitors in such small peculiarities as the tone of voice or the colour of the hair. We may well cultivate humility in our ignorance of cell functions. The cellular growth from the germinal spot is far in excess of what occurs in any tumour. Here the cells seem to obey fixed laws, and to be marshalled in orderly array, as though an intelligent power were directing their complicated layers and arrangements.

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[1] *Brit. Med. Journ.* 26th Feb. 1887.

[2] *Path. Soc. Trans.* vol. xxv.

The explanation of the growth of tumours is an explanation of the powers possessed by the protoplasm of cells. So far as "secondary" growths are concerned, they undoubtedly start and rapidly increase from a very minute focus, probably a single cell, endowed with remarkable reproductive properties.[1]

Naked-Eye Appearances of Scirrhus (Spheroidal-Celled Carcinoma of the Hard Type).—The naked-eye appearances of the ordinary hard spheroidal-celled carcinoma are very characteristic and important. A nodule of hard carcinoma, even the size of a haricot bean, gives a marked resistance on section, is hard and glistening, studded with minute yellowish puncta, which are cellular degenerated masses projecting from the divided acini and ducts. The toughness and hardness shades off into the surrounding tissues, which are drawn towards the cancerous focus, the skin and nipple particularly being tied down by white, fibrous, contracting, radiating bands towards the central growth. In marked cases the tough fibrous tissue gives a creaking sound on section, and the cut surface becomes concave. These phenomena are not universal. If the growth be washed in water, treated with a 5 per cent solution of nitric acid, and again washed, the cancer appears as a distinct white mass, while the fat and fibrous tissue are swollen and gelatinous.[2] The radiating bands of infected tissue are strikingly shown in this way. A reference to Plate XIV. will show faithfully the naked-eye appearances of hard carcinoma. They are immensely useful in a diagnostic sense, and as important as microscopical investigations. Upon the naked-eye appearances of a section, the final verdict of complete removal of the mamma often rests. It may be pointed out, that some exceptional cases of rapidly-growing carcinoma are distinctly encapsuled. This condition is very rare, but I have seen it myself, and have notes of four cases which are undoubted. The encapsuled state of some rapidly-growing cancers, may perhaps explain an apparent anomaly between clinical experience and microscopical examination, for it has several times been observed, that cases of long immunity from recurrence have been found among some instances of bad and rapidly-growing cancer. The two conditions which closely resemble scirrhus to the naked eye and on section are old-scar tissue, or an old inflamed and adherent fibro-adenoma. In both of these the central nucleus or "core" is devoid of the hard, gristly appearance of true cancer. It may be practically affirmed that the harder varieties of carcinoma are never encapsuled. Yet even this rule has its exceptions.

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[1] Beatson of Glasgow in 1897 drew my attention to a paper by Goodsir (*Anatomical Observations*, vol. ii.) on "Centres of Nutrition." This author affirms that groups of cells occur in organs of unusual reproductive activity. The possible origin of carcinoma in these is not to be lost sight of.

[2] Stiles's method.

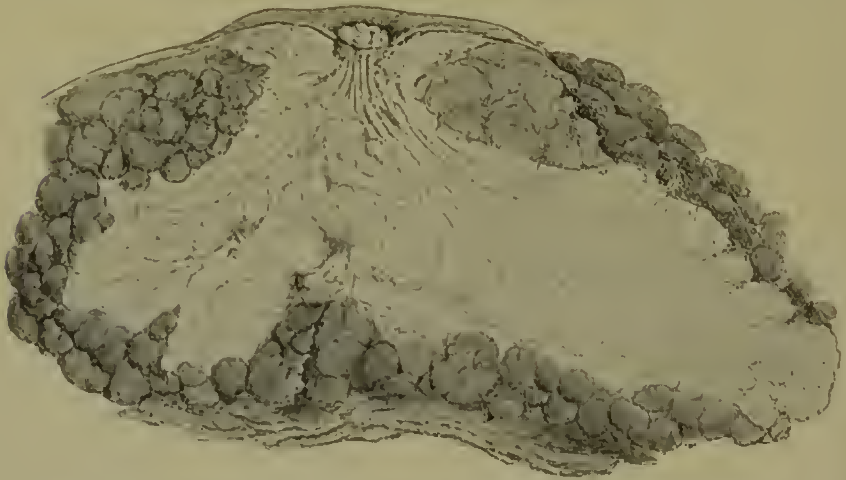

FIG. 10.—The typical hard cancer of the mamma, showing the retraction of the nipple and skin, and the incorporation of the growth with surrounding tissue. From a specimen in the Museum of St. George's Hospital.

Thus an undoubted case is placed on record by Cullingworth, where a woman died of cancer of the pylorus, and a hard, movable lump was found in the mamma, which on section proved to be a hard "scirrhus" surrounded by a distinct fibrous capsule. The microscopical details were verified by T. Jones of Manchester, and Dreschfeld. A similar specimen is referred to under the care of Jessop of Leeds, examined by Hardwicke, and pronounced "encapsulated scirrhus." The importance of such cases in a diagnostic sense is great, since the characters of an innocent growth might be most closely simulated.[1]

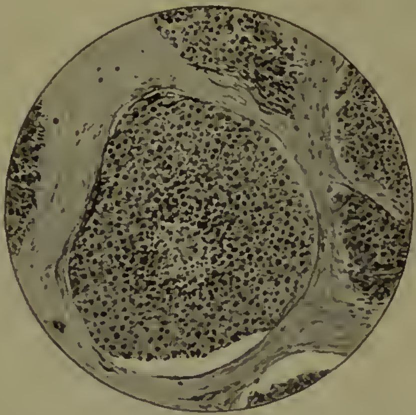

FIG. 41.—Proliferation of the epithelium in the early stage of mammary cancer.

Microscopical Appearances.—The earliest change usually observable by the microscope in carcinoma of the mamma, is a morbid proliferation of the acinous epithelium, which not only fills the acini, but also the ducts in immediate relation with them. The first certain sign of the dangerous nature of the affection, is furnished by a small-celled infiltration of the surrounding tissues. There seems every probability, that the infective cellular elements spread mainly along the lymphatic trunks, which commence by microscopical channels among the peri-acinous spaces. Yet the rapid dissemination of the disease all over the body in some remarkable cases, goes far to prove that the elements of the growth may be also carried by the blood stream, though this is hard to demonstrate. As the growth progressively increases, larger and larger areas of mammary substance are affected. It is always most noteworthy, too, that the infected area will always be considerably more extensive than the growth itself. Irregular columns of infective cells pass along the lymphatics to the glands, which become rapidly implicated. The alveolar arrangement, so often spoken of in spheroidal carcinoma, is largely due in my belief to the oblique, transverse, or longitudinal section of multitudinous ducts and acini filled up with epithelial cells. The arrangement is often essentially tubular, the ducts being seen filled with columnar epithelium. When the new growth is well established, however, a marked stroma is generally developed, sparsely nucleated, and containing in its meshes clusters and groups of large granular nucleated cells, which lie in contact with each other. The more scanty fibrillar and richly nucleated the stroma, the more abundant and plump the cells, the more soft and friable will be the growth, and the more it will approximate to the type of soft cancer formerly called encephaloid. On the other hand, the more the fibrous tissue of the stroma is developed, the smaller and more atrophic the cells, the more the growth will assume the fibrous, hard, or "ligneous" cancer of the older writers. Between these two types every kind of growth will be found. Even in different sections of the same tumour very varied appearances may be demonstrated. Towards the centre the structure may be so entirely fibrous that the form, structure, and indeed the "very life" is "squeezed out" of the cancer elements, which are merely represented by some atrophic cells or amorphous débris. A superficial observer might readily pronounce such tissue to be merely inflammatory, and atrophic cancer closely resembles the contracting cicatricial tissue of an old scar. In the neighbourhood of the periphery of the tumour, the characteristic alveolar stroma and cell proliferation will be more evident, while sections of the fat and fascia outside the growth, will generally show the infective elements invading the lymphatics (Fig. 50, p. 353).

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[1] *Brit. and For. Med.-Chir. Rev.* 1875, 218-224.

I repeat that the naked-eye appearances of even a small nodule of scirrhus are perfectly characteristic and as important as microscopical details. I have more than once noticed that in specimens of chronic inflammation, when one feels doubtful as to whether early cancerous change has commenced or not, the same doubts are present to the mind of the microscopical observer, if he be an accurate and careful person, and aware of the difficulty of the observation he is engaged in.

Appearances of Duct Cancer (*Villous Carcinoma*).—The naked-eye characteristics of the villous variety of duct carcinoma are as follows. The tumour will be probably situated immediately beneath or near the nipple, which is usually not retracted. True duct cancer may, however, occur near the periphery of the gland. Bernard Pitts removed a specimen from the periphery of the breast of a lady aged fifty-three.[1] In 1897 I removed a carcinoma from the axillary aspect of the breast of a woman aged sixty-eight, a patient of Dr. Wynne of Limpsfield. To my surprise this was marked duct cancer, though far from the nipple. In exceptional cases, too, villous duct cancer may present at the nipple as a fungating mass, presenting a strange appearance. The section will not be so hard as that of a spheroidal carcinoma. The tumour will generally be honeycombed with cysts, containing altered blood and breaking-down growth. The substance of the tumour may be exceedingly soft and friable. Its colour will be dark brown or red, and in some cases the altered blood may closely resemble melanotic deposit. When the cystic cavities are numerous, the growth almost exactly resembles a section of a thyroid tumour, and this is the best description I can offer to the reader of naked-eye appearances very difficult to describe.

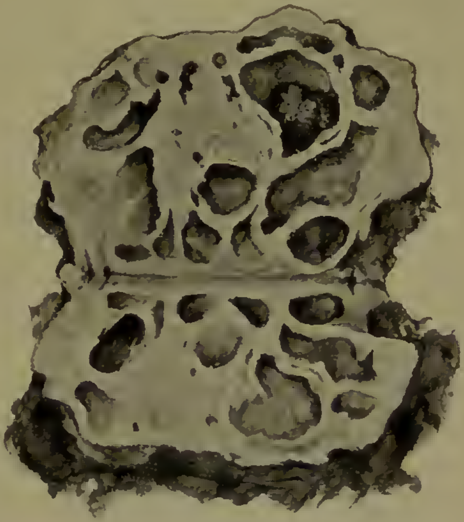

FIG. 42.—Naked-eye appearances of a section of villous duct cancer. The tumour is honeycombed by cavities, containing blood or soft growth. From a specimen in St. George's Hospital Museum.

Minute Anatomy of Duct Cancer.—It is a matter of some difficulty to write intelligibly regarding the minute characters of this remarkable form of growth. There can be no doubt that it is only in quite recent times that the structure of this peculiar tumour has been recognised, and ten years ago many specimens were confounded with rapidly-growing spheroidal-celled carcinoma, or more commonly with varieties of soft sarcoma, or included under the term "tubero-cystic disease." The descriptions of various authors regarding "duct cancer" are even now very conflicting, and I feel sure that further researches into its structure are very needful before definite statements are justifiable.[1]

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[1] *Path. Soc. Trans.* vol. xxxix.

I have examined carefully six undoubted specimens of the villous variety of duct carcinoma, and the truth, so far as can be ascertained, appears to be as follows:—The disease commences as the well-known duct papilloma. Into the ducts, or into cystic dilatations of them, simple papillary growths project. They frequently bleed and cause a hæmorrhagic or coloured discharge from the nipple. They may so increase as to fill the cavity in which they originate. In certain cases the epithelium becomes heterologous, and spreads through and beyond the lining membrane of the duct as an infective growth. The papillary projections are composed of flimsy epithelium loosely held together, and generally attached to a delicate central stalk containing blood-vessels. They grow and combine with each other in the most intricate fashion. When such a growth becomes heterologous and spreads through the surrounding mammary substance, the ducts become extremely obstructed and dilated, forming innumerable cysts, and masses of cellular growth extending along them give to the growth that appearance to which the name "tubular" cancer has been applied. The cellular offshoots coalesce and join together very freely, enclosing secondary spaces which become cystic, and this junction of cellular masses is a marked microscopical feature of the disease. The cell proliferation may be so extensive that masses may even be seen in the peri-glandular fat or cellular tissue. Thus the sign of cancerous change is the advance of the epithelium into surrounding tissues. It is not

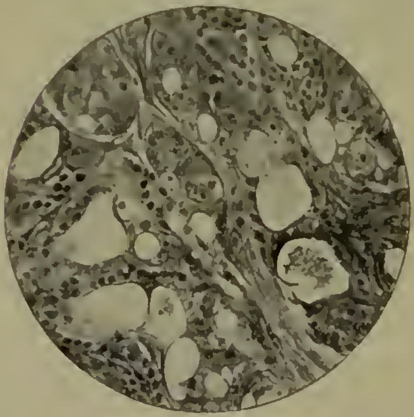

FIG. 43.—Section of the villous variety of duct cancer. The papillary processes coalesce and invade the mammary tissue.

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[1] This is only my individual opinion. Many pathological experts look upon the matter as settled and "thrashed out."

to be expected that a growth of this nature would exist without hæmorrhages. Cystic cavities filled with altered blood of all colours are exceedingly common. Extravasation of blood among the cellular elements gives rise to pigmentary changes, these growths being often rust-coloured, brown, or nearly black.

The hæmorrhage and breaking-down growth may be so excessive that practically sanguineous cysts are found. An excellent example of this is related by Godlee.[1] Here, from the recurrence of the tumour, and the fact that an axillary gland was affected, the diagnosis of carcinoma may be strongly suspected, while the appearances described are very suggestive of "duct cancer," though the author does not thus explain the appearances.

Beck and Godlee, in reporting on a specimen of Nunn's,[2] mention the rarity of this variety of cancer, which they pronounce to be characterised by:—

1. A coarse fibrous stroma.
2. Large spaces lined with epithelium and often filled with blood.
3. The projection of villous growth into these spaces.
4. A tendency to infiltrate surrounding tissues.

Thin[3] gives an elaborate account of the histology of a case of breast carcinoma, where there was a disposition to form columnar epithelium. Together with Waldeyer he believes that in these cases the morbid change in the epithelium begins in the lactiferous ducts.

The cysts of duct cancer may be filled by coalescing dendritic papillary growths, or broken-down cellular products, or blood, or mucoid material, and in two of my own cases the growths were multiple in the same breast. In the earlier stages, at all events, the tumour is usually encysted, and the surrounding breast substance is not drawn, incorporated, and puckered to the tumour, as is the case with "scirrhus." In four of my cases, prior to removal, the diagnosis of cystic sarcoma was positively given, and only the microscope declared the true nature of the tumour. The distinctions between sarcoma and carcinoma in this class of tumours is peculiarly difficult. If many sections are cut in different parts very diverse appearances may be seen, the opinions formed from one section rather tending to controvert those formed on another. All the above description applies to those duct cancers which originate in papillary growths (malignant papilloma, villous cancer). The tumour may be hard and fibrous, and yet on careful examination columnar epithelium will be found, and the name columnar-celled carcinoma applied to the growth. Many excellent authorities term such tumours "duct cancers." No doubt, as in Paget's disease of the nipple, the disease in many cases begins in the ducts, and thus one may find a marked proliferation of squamous epithelium at the mouths of the larger ducts, an increase of columnar epithelium, and deep in the breast a spheroidal-celled carcinoma, changes of type of cells taking place as the disease spreads. Under such circumstances, the term duct cancer has a wider significance than may at first sight be thought, and different names may be given to the tumour according to the position of the section. Battle[1] relates a case of duct cancer in a lady aged forty-four. In his case the tumour was the size of a nutmeg, embedded in the right breast. The nipple was not retracted. Shattock examined both this tumour, and the one removed from the periphery of the mamma by Mr. Pitts, and his report is worth referring to.

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[1] *Path. Soc. Trans.* vol. xxvii.

[2] *Ibid.* vol. xxxi.

[3] *Ibid.*

In the second case, he reported that "the tumour was composed of branched intercommunicating trabeculæ of connective tissue invested with epithelium. The epithelium is single-layered, at some places cubical, in others columnar, and it circumscribes laminæ of about the same breadth as the trabeculæ themselves. The spaces hold in many parts a faintly stained, transparent, structureless, alveolated substance in all respects like that seen in ovarian adenoma. . . . The tumour would appear therefore to have arisen by papillary outgrowth from the wall of a cyst, and to be classed as a villous carcinoma."

An excellent example of duct cancer is also related by Moore[2] of Melbourne. The tumour was honeycombed with cysts full of intracystic growth, or breaking-down blood-clot. The nipple was not retracted; it was flattened and atrophied, although it lay directly over the tumour.

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[1] *Path. Soc. Trans.* vol. xxxix.

[2] *Lancet*, 9th June 1894.

The following is a good example of a duct cancer of the mamma.

A woman, aged sixty-six, was admitted into St. George's Hospital on 23rd October 1894. Thirty years ago she had an abscess of the left breast. For two years she has noticed a swelling in the left mamma, which has increased rapidly in the last two months. She is in good health and has not lost flesh. In the left breast is a large, moderately hard tumour occupying the central and upper parts of the gland. There are several softish projections like cysts. The nipple is not retracted, but is flattened. The skin is thinned and adherent. There are no adhesions to the deeper parts, and the axillary glands are not involved. Just above the nipple the centre of the tumour felt "like scirrhus."

After removal it was reported by Dr. Rolleston that cysts, some of which contain altered blood, form the bulk of the tumour. In part the tumour was a duct papilloma, in other parts the villous processes containing a central fibrous core or blood-vessel are widely infiltrating the surrounding tissue. In parts the tumour has the appearance of an ordinary spheroidal-celled carcinoma. This association of appearances of duct cancer and spheroidal carcinoma has been noticed by many microscopists.

Notable features in this case are the presence of cysts and the absence of gland implication, though a carcinomatous tumour had been growing for full two years in the mamma.

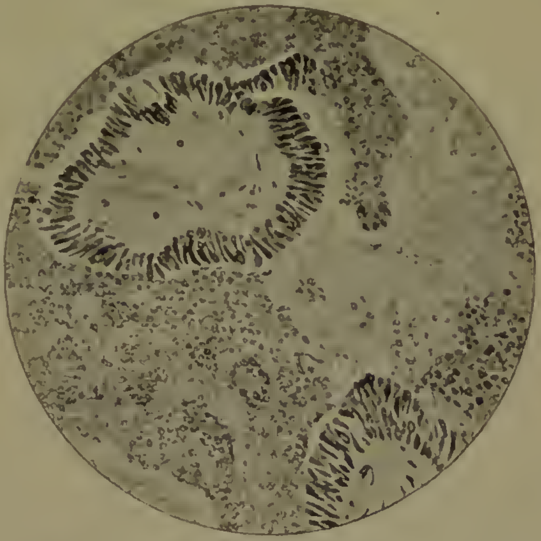

Fig. 44. Duct cancer invading an axillary gland. From a specimen of Mr. Lunn's, removed from a male ninety-one years of age.

It must be remembered that villous duct cancer is only now receiving due recognition and investigation, and the after-history of cases is largely wanting. But perhaps when the "after-progress" of a number of operations for "duct cancer" is carefully watched, instances of recurrence in the glands or metastatic deposits will not be so infrequently met with. It is interesting to observe that Shattock, in examining an old museum specimen in St. Thomas's

Hospital, found that a growth of the rib "secondary" to supposed scirrhus of the breast was really a deposit of "duct cancer." Mr. Shattock's pathological opinion is beyond criticism, and he refers to Butlin's case of local recurrence, and to Godlee's well-known case, where glandular implication was observed.[1] These considerations are grounds for further careful investigations, and for treating these tumours on the same principles as one treats all carcinomata. So far as we now know, if very complete extirpation is carried out, permanent freedom is likely to be obtained. That cases formerly classified as cystic sarcomata were probably duct carcinomata is well shown by Erichsen in a letter in the *Lancet* for 14th February 1852. That surgeon there relates the recurrence of "scirrhus" in the scar of two cases where the breast had previously been removed for "cystic sarcoma."

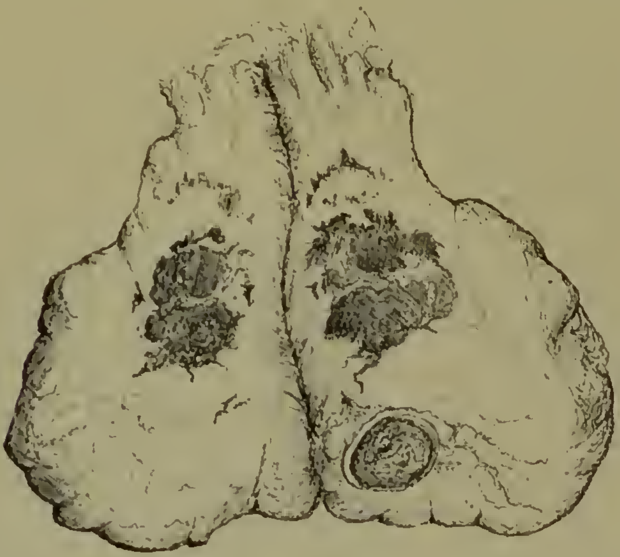

Fig. 15.—Hæmorrhagic carcinoma. From a specimen in the Museum of St. George's Hospital.

SECONDARY CHANGES AND DEGENERATIONS

Hæmorrhagic Carcinoma.—Hæmorrhagic exudation is not unknown in carcinomata, whether hard or soft, and may readily be precipitated by accidental blows or squeezes.

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[1] *Path. Soc. Trans.* vol. xxxix. p. 325.

Warren[1] speaks of a lady, aged fifty-two, who, running away from a cow, fell and struck her breast. A swelling arose, which took on the characters of "scirrhus." On removal the remains of the effused blood were found in the interior of the tumour surrounded by a cyst wall.

This was probably one of those cases now termed traumatic malignancy, and the effused blood was due to hæmorrhage into a cyst. There is a truly remarkable specimen to illustrate hæmorrhage within cancer in the Royal College of Surgeons.[2] The tumour contains two large cysts, each the size of an orange, containing broken-down growth and altered blood. The naked-eye appearance of the specimen makes me suspect that it may have originated as a villous duct cancer. The museum of St. Bartholomew's Hospital also contains a fine specimen.[3] Here there are three large cysts, the size of a hen's egg, filled with altered blood. There is also a specimen of a huge blood cyst in carcinoma in the museum of the Royal College of Surgeons of Edinburgh. This is the largest I know, and the cancer seems of the hard variety.[4]

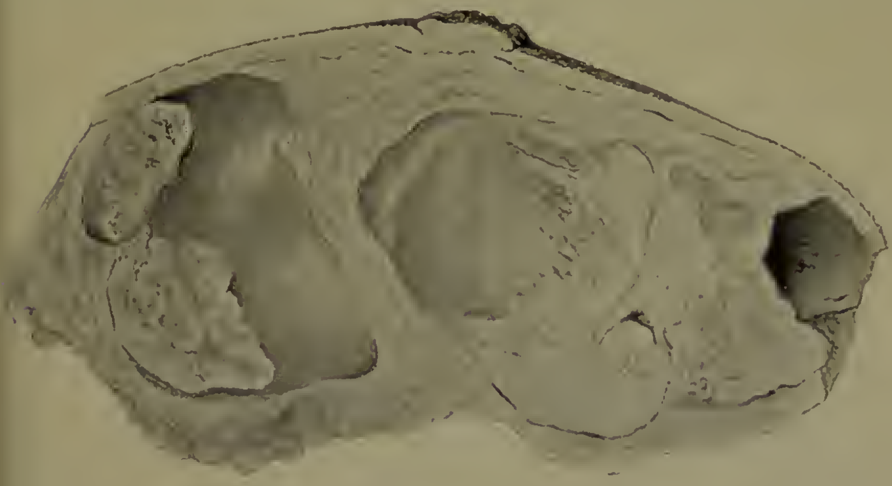

FIG. 46.—A cancerous breast containing large cavities filled with altered blood-clot. From a specimen in the Royal College of Surgeons.

Newly formed vessels readily give way, and hæmorrhagic exudations are intermingled with the cancer structure, or may form definite encysted collections of blood. The effused blood may undergo various changes, and the corpuscles breaking up may give to the growth a discoloured appearance, brown or black, which has even led to the belief that the growth was melanotic.

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[1] *Surgical Observations on Tumours*, p. 6.

[2] 4972 B. [3] 3184 B. [4] XXXIV. B.

A tumour of this nature was removed by my colleague, Mr. Turner, in 1895. I saw a fresh section of it. The surface of the growth was thickly studded with black deposits the size of buck-shot. Under the microscope these deposits were merely altered and degenerated blood. The growth was a spheroidal carcinoma. Curiously enough, the secondarily infected glands in this case were also filled with deposits of altered blood. In 1895 a similar case was operated upon by Mr. T. Pick. In this case also there were cavities in the glands of the axilla, the size of split peas, full of hæmorrhagic material. The growth was soft carcinoma.

Colloid Degeneration.—True colloid change in scirrhous cancer is more often spoken and written about than seen. There are two excellent specimens in the museum of Westminster Hospital, and the College of Surgeons contains six examples. It is quite exceptional to find in the mamma tumours composed of a tremulous jelly-like material such as we are familiar with in the peritoneum. Early colloid change in the cells of rapidly growing carcinoma is, however, not uncommon. Pathologically, mucoid degeneration is very difficult to differentiate from colloid change. Clinically, colloid change in mammary cancer seems of little real importance.

Mucoid degeneration may give rise to the formation of cysts of large size in rapidly growing cancers.

Eve[1] draws attention to the fact that in some specimens of cancer termed "colloid" the degeneration is rather in the connective tissue than the cells, the change being really mucoid.

Good examples of colloid carcinoma, of hæmorrhagic degeneration, and of caseation in scirrhous cancers are given in a paper by Masterman.[2]

In one of his cases, in a woman aged forty-seven, the growth on section showed a gray-coloured matrix with numerous collections of sebaceous-looking material, which could be squeezed forth, as out of an acne spot. Under the microscope extensive areas of caseation were seen, attributed to changes in the cells and stroma, or possibly to degenerating dense clot, due to former hæmorrhages.

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[1] *Path. Soc. Trans.* vol. xxxvii.

[2] *St. Bart. Hosp. Reports,* vol. xxvii.

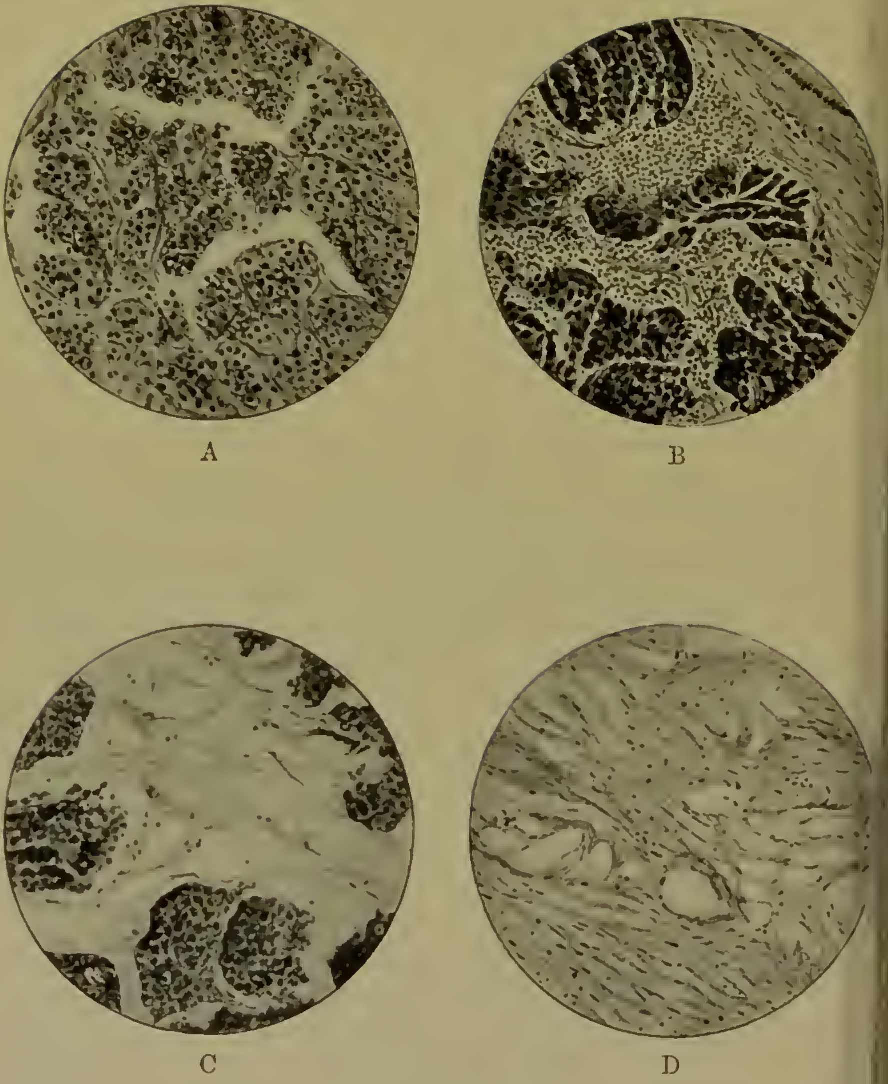

PLATE XII

Four varieties of carcinoma mammæ. A, Rapidly-growing spheroidal-celled carcinoma. B, The microscopical appearances of hæmorrhagic carcinoma. The blood is effused between the groups of cancer cells. C, Colloid cancer. Large areas are converted into a jelly-like material, traversed by faint bands forming an alveolar structure. D, Atrophic carcinoma. The section closely resembles scar tissue, injection cells are scattered here and there.

To face page 323.

Excellent illustrations of "colloid" carcinoma of the mamma will be found in the *Pathological Society's Transactions,* vols. xxviii. and xxx. One of the specimens here described was removed by Lord Lister, and it is important to observe that it was clinically indistinguishable from ordinary carcinoma. A typical case of this degeneration is also related in vol. xix. of the *Pathological Society's Transactions* by Cooke. The gelatinous material is described as being contained in loculi three-quarters of an inch in diameter. Several of our London museums contain specimens labelled as colloid carcinoma of mamma, but the naked-eye appearances are far from being very marked.

Fatty Degeneration and Caseation are common enough in mammary carcinoma. Such changes may be brought about by accidental obstruction of the vessels, by thrombosis, or by contraction of fibrous growth cutting off the nutrition of the cellular masses. The areas of altered tumour substance have the usual yellow or ochre colour, and under the microscope the tissue will be found composed of cellular débris and fatty material.

There is a good specimen to illustrate caseation in scirrhous cancer at the College of Surgeons.[1]

Atrophic Degeneration of Scirrhus is very important from a clinical point of view. It appears to be caused by diminution of vascular supply, and hence is commonly found in spare and thin persons, in the aged and weak, and in those whose circulation is feeble. This is not universally the case, however, and the cause of this important degeneration is not quite clear. Microscopically, the growth closely simulates fibrous tissue, and with some difficulty collections of atrophic cells and débris are here and there found by the observer, which mark the true nature of the affection. It would be difficult enough, however, for any pathologist apart from clinical assistance to distinguish a section of old atrophic cancer from scar tissue. Cases of this remarkable degeneration tending to so-called "spontaneous cure" will be quoted at the end of this chapter.

True osteoid changes are exceedingly rare in scirrhous cancer of the breast. The association with sarcoma of this degeneration has been noticed.

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[1] 4798.

A curious specimen was exhibited at the Pathological Society, London, in May 1871, by Sir T. Smith. It consisted of a peculiarly hard and bloodless scirrhous cancer associated with a large cyst. The portion of tumour nearest to the cyst has undergone calcareous change.

Warren reports the case of a patient, forty-five years of age, who had a tumour of the breast which had been slowly increasing for two years. The growth was hard, and it was removed under the diagnosis of scirrhus. On examination there were three separate nuclei of calcareous matter, each about the size of a hazel-nut, lodged in the midst of a "scirrhous mass." [1]

Clinical Course.—The clinical course of cases of carcinoma of the breast is in the vast majority of instances steadily from bad to worse. If a hundred cases of this malady, unchecked by operation, were observed, the greatest differences would be observed in the rate of growth, the positions of the secondary metastases, and the duration of life of the individual. Any prognostic estimates of exact time which we may commit ourselves to, are apt to be rudely falsified. The duration of life in these cases depends upon factors beyond our calculation. We cannot exactly estimate the resisting power of the individual to the ravages of the disease, neither can we foretell such quickly fatal terminations as cancerous pleurisy, carcinoma of the brain, or purulent phlebitis. It thus happens that sufferers from this malady have lived long enough to witness the decease of the medical attendant who, relying upon statistical observation, had years before condemned them to a speedy death! [2] Nothing shakes the confidence of the public in the medical profession so much as bad prognosis founded on insufficient data. Such opinions are little better than rough guess-work, and should be rejected by every thoughtful man. All statements of the periods of life allotted to cases of cancer not operated upon, must be acted upon with the greatest caution. Any such statistical tables here quoted are inserted out of deference to the opinions of those who have compiled them, and to present the subject to the reader in all its aspects.

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[1] *Surgical Observations on Tumours*, p. 214. See also Ackermann (*Virchow's Archiv*, Bd. 45, S. 60).

[2] Sir Anthony Carlisle in a consultation with the celebrated Lynn at the Westminster Hospital mentioned the case of a Mrs. Gordon, who had lain there for thirty-two years covered with cancerous sores and who at last died of old age.

Thus Paget estimated that the average duration of life in carcinoma of the breast is about four years. Baker, three years and seven months. Sibley, two years and eight months. Gross, two years and three months. Williams, three years and eight months. Sprengel, Oldekop, and Winniwarter, quoted by Jamain and Terrier, two years and three months and two years and five months respectively. Sir Astley Cooper gives from two years and six months to four years in cases not operated upon.[1]

Period of Ulceration.—Sooner or later the prominent and livid tubers of cancer infiltrate the adherent skin, which by a combination of pressure and ulceration gives way, leaving a foul ulcer with hard indurated edges and exuberant granulations. The discharge is watery and offensive, and attacks of hæmorrhage are frequent. The pain may be intolerable, or, strangely enough, may be little complained of. And now the patient begins to assume that sallow and cachectic aspect so significant of the disease. The glands in the axilla and neck enlarge, and the upper limb swells to an enormous size from pressure upon the main vein.

A case is related in vol. xxxv. of the *Pathological Society's Transactions*, where gangrene commenced in the fingers of a woman who had growth, apparently cancerous, removed from the right breast. She suffered from recurrence in the left mamma, and masses of indurated glands were found above the clavicle on the left side. The account is not clear, but it would seem that the ulceration of the fingers was due either to direct pressure upon the subclavian artery or to disturbance of, and pressure upon, the brachial plexus. I have never seen such a result myself, and I think the condition one of great rarity.

In other cases the fungation and ulceration is less, but the integument of the thorax becomes generally infiltrated, smooth, shining, board-like, resembling thick bacon rind or exaggerated scleroderma ("cancer en cuirasse").

Occasionally the skin of the thorax and abdomen may become studded with innumerable nodules of cancer, varying from the size of a buck-shot to a marble (Fig. 55, p. 454). These are hard, strangely mobile, and only when large do they show lividity, enlargement of the superficial veins, or a tendency to become adherent and ulcerate (lenticular carcinoma). Even these may undergo spontaneous disappearance. Such dissemination is usually associated with visceral deposits, especially cancerous pleurisy, or carcinoma of the liver with jaundice. At any time the phenomena of spontaneous fracture of the bones or carcinoma of the spine may become evident.[1] The common cause of death is undoubtedly sepsis, to which is due the sallow and unhealthy aspect commonly termed cachexia.

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[1] As lately as 1896 I know of a case where a prominent surgeon told a patient suffering from cancer of the breast she would die within six months, and that "nothing could be done" for her case. This lady naturally placed herself under the care of a quack. Her cancer is of the atrophic form, and I doubt not that she will survive many years. I quote this instance to show how mischievous to repute of surgery such positive opinions are apt to prove.

The foul discharges are laden with organisms, and a hectic temperature with exacerbations is generally observed in ulcerating carcinoma. The gradual exhaustion and pain wear out the sufferer.

Erysipelas may attack a cancerous ulcer of the breast, and the marked improvement sometimes afterwards observed has formed a basis for treatment by the artificial production of the disease. The septic processes associated with erysipelas may, however, prove fatal, as in the following case:—

A hearty old woman, toothless, but of a good colour, was admitted into St. George's Hospital on 12th January 1885. She has noticed a hard, painful lump in the right breast for two years. About two months before admission the tumour began to fungate. The growth was the size of a small cocoa-nut, and the surrounding skin dusky and inflamed. The most prominent part of the tumour was sloughing, and covered with foul granulations. It was hard and indurated, with a tendency to bleed. The axillary glands were not affected. On 20th January she was attacked with febrile symptoms, and an erysipelatous blush appeared and spread extensively over the thorax and back. Despite careful nursing and attention, she died prostrate on 6th February.

Other causes of death are usually attributable to the results of metastatic deposits. Thus such conditions as paraplegia with bed-sores, cerebral growth and softening, embolism or sudden and profuse hæmorrhages, will inevitably hasten the end of a scene distressing to all concerned in it. Often enough, however, when a patient seems near death, a large mass of cancer may slough away, and great improvement, or even temporary cicatrisation, take place. The surgeon cannot be too careful, therefore, in making definite prognoses in cases which may seem perfectly hopeless.[1]

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[1] The terrible distortion and multiplicity of fractures which occur in some of these distressing cases are well illustrated by a life-size plaster cast in the museum of St. Thomas's Hospital (673). This is also a good example of "fragilitas ossium," associated with carcinoma.

"The duration of the disease or rather of life in cancer," says Nunn, "may vary from months to years. The almost inevitably fatal terminations of cases apparently similar are sometimes early, and sometimes long deferred. The patient may die within the year from the discovery of the nodule in the breast, or may survive from ten to twenty years. Prognosis is therefore especially difficult."

At the Clinical Society in 1882, the same authority related a striking case showing how misleading are the symptoms that arise during the progress of a case of cancer. The woman was an out-patient at the Middlesex Hospital in July 1868. Three years before, the left breast had been removed for cancer by the late Mr. Henry Smith. Along the margin of the scar were some yellow-red tubers, the size of hazel-nuts. The patient had discovered the tumour two years before Mr. Smith's operation, so that at the date of her application at the Middlesex Hospital, it had existed for five years. She was admitted as an in-patient in June 1870, the sixth year of the disease. The nodules had increased and there was evidence of deposits in the liver. In July, pain in the back became very marked, and she could not raise herself or turn in bed. In August the cancerous mass in the cicatrix became gangrenous and sloughed clean out. The sore healed and remained sound for the rest of her life. In October and November ensued numbness and motor paralysis of both legs. In February 1871 Dr. Thompson diagnosed pleuro-pneumonia of the left lung. By 18th July of this year the patient had so far recovered as to be able to walk across the ward. In October of this year the left thorax was noted to be dull. In January 1872 she had pleuritic symptoms of the right side. She died in August 1872, the disease having lasted upon her for eight years. A remarkable fact, also noted by De Morgan, was that certain tubercles wasted away and almost disappeared.

This case, the leading features of which alone are mentioned, serves to illustrate (1) that cancers may slough out and heal; (2) that tubercles of cancer may spontaneously wither and disappear; and (3) that even with the most threatening symptoms prognosis must be very guarded. Such cases are far from uncommon, and I have seen several in my own experience.[1]

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[1] I have purposely omitted from this work illustrations of the more hideous extensive ulcerations and lesions of late cancer. They are, unfortunately, familiar enough to every medical man, and serve little instructive purpose.

Bearing in mind that the ordinary cause of decease from mammary cancer, is exhaustion produced by sepsis and discharges, some more exceptional causes of death from the disease may now be pointed out to the practitioner.

It is not often that patients die of actual bleeding from the cancerous sore, though repeated small hæmorrhages may weaken and add to the general exhaustion. Mr. Nunn, however, alludes to a case under the joint care of himself and Dr. Skrimshire, where the patient died from unrestrainable hæmorrhage, which no styptics would arrest. The blood was watery and refused to coagulate. In this case there was disseminated malignant disease and deep jaundice. The tendency of deeply jaundiced patients with malignant disease to bleed obstinately, was well illustrated by a case I operated upon at St. George's Hospital in August 1895.

An emaciated middle-aged man had obstructive jaundice, and an exploratory operation was undertaken. I found a cancer of the pancreas obstructing the duct, and established an external biliary fistula. Great relief followed, but for many days there was uncontrollable oozing of blood, which nearly destroyed the patient's life. Chloride of calcium was administered, but I do not know that it materially acted in checking the bleeding. I would therefore advise every surgeon to be cautious in performing a cutting operation on recurrent cancer of the breast, if deep jaundice were also present from concomitant carcinoma of the liver.

A woman, aged seventy-nine, was admitted into St. George's Hospital on 5th July 1894, with an extensive fungating carcinoma of the left mamma which had been growing for four years. She had applied at University and the "Cancer" Hospitals, but was told her case was too advanced for operation. The same opinion was expressed at St. George's, and she was admitted into one of the beds devoted to cancer patients. Two months before admission a severe hæmorrhage took place, weakening the patient considerably. On 17th September it was noted that the patient had suffered from two severe attacks of bleeding. On 9th October she had another severe attack of hæmorrhage, and died quite suddenly.

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[1] Some extraordinary cases of a like nature were mentioned at the debate upon the author's paper on "Latency and Freedom from Recurrence after Operations for Cancer of the Breast," at the Med.-Chir. Soc. in 1898. Space forbids the quotation of these most interesting histories.

The following case is worth attending to, because it well illustrates (1) a most unusual circumstance, double carcinoma in the same breast; (2) the occurrence of cancerous pleurisy: (3) recovery from conditions apparently hopeless, so often observed in these patients.

At a clinical meeting of the North-West London Hospital on 20th November 1895, related in the *Clinical Journal*, 4th December 1895, Dr. Gill related the case of a woman aged sixty-four, who three and a half years before had two very large cancerous growths in her right breast, one in the upper half, and the other in the lower, but totally distinct, without any connecting link whatever, which he believed was very unusual. The late Mr. Beck, whose experience was large, had never seen such a specimen. During the last three years Dr. Gill had on four occasions removed secondary growths over the line of the axillary incision made in the primary removal. Recently the woman was seized with very bad breathing, and could hardly get about. The right side became filled with fluid, and aspiration was performed just in time to save life. Aspiration was performed three times, and once a quart of fluid was drawn away, the patient being nearly moribund. He had that day examined her and found that all dulness had disappeared; the patient was up, and seemed to have taken "a new lease of life." A growth had now occurred on the opposite side, and he was of opinion that secondary growths existed in the left lung. In October 1896, Dr. Gill kindly informed me that this patient was living and strong. He had aspirated the chest altogether six times, removing on several occasions nearly pure blood.

The following case illustrates how carcinoma may exist unsuspected in the voluminous mamma of the very obese, and how a fatal termination may be brought about by unexplained pleurisy.

A cook, aged fifty-two, was admitted into St. George's Hospital on 29th November 1865, under the late Dr. Fuller's care. She was found to have left hydrothorax and considerable dyspnœa; but as she was excessively fat, the mammary affection was not noted. She died on 28th December from exhaustion. At the necropsy a "scirrhous nodule" was found in the left mamma, and the parietal layer of the pleura was also studded with small, hard, malignant deposits, most abundant on the surface of the diaphragm.[1] It was obvious that the primary infection was in the breast.

This is a matter of great importance in the causation of unexplained pleurisy in an elderly woman, and also illustrates an unexpected cause of death in carcinoma of the mamma.

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[1] Post-mortem and Case Book of St. George's Hospital for 1865.

"Cancer en cuirasse," where the thoracic wall is infiltrated with disease, may actually kill by suffocation. A remarkable case where death took place from this cause is related by Coupland.[1] The patient was only twenty-four years of age; both breasts were affected and both ovaries also.

Instances of cancer recurring in the spine and bones are common enough. Paraplegia and multiple fractures usually shorten life in these cases.

A very striking case of osteomalacia carcinomatosa following removal of the breast is given by Ritchie and Stewart in vol. xv. of the *Edinburgh Med.-Chir. Trans.* Six years after the operation by Annandale the patient suffered from severe "rheumatic" pains, her stature became altered, and before she died one of the ribs spontaneously fractured. The skeleton exhibited the changes seen in osteomalacia, and microscopical examination showed extensive spheroidal carcinoma in the osseous tissue. The long period which elapsed between the removal of the primary focus and the signs of bone infection is very interesting. The authors in a very comprehensive paper mention cases by Forster and Rokitansky and Snow to illustrate the same facts. In one of Forster's cases the bones were so soft, they could be cut with a knife. An important pathological fact came out clearly in this paper, that cancerous infiltration of the bones did not lead to expansion, but rather to thinning and atrophy, and when fracture occurred the bones might really be thinner than normal. The majority of speakers emphasised the opinions of Volkmann, Rokitansky, and Rindfleisch, that carcinoma of the bones is far more common than is generally believed after removal of the mamma for carcinoma.

A good illustration of death from multiple metastases especially affecting the bones is as follows:—[2]

A woman, aged fifty-four, admitted for progressive emaciation with shooting pains in left shoulder and down arm, and enlarged glands on both sides of neck. Sharp pains were experienced in the back between the shoulders, and the arms were excessively weak; she could stand only when supported. Salicylates were freely given, and she somewhat improved. After being an in-patient for a month, a tender swelling was observed over the left seventh rib, and other anomalous symptoms had meanwhile been observed, as dyspnœa, thickening about the cervical spine, with signs also of impairment of breathing, the air entering the right lung with difficulty. The lump on the left seventh rib drew attention to the mamma, when the nipple was found retracted, with a mass of cancer in the substance of the breast about the size of a walnut. Finally, the patient died with increasing dyspnœa and exhaustion. Full details of the necropsy will be omitted. Deposits of malignant disease were extensively found in the spine and ribs. Dr. Taylor remarks, "The above case tells its own tale." A primary scirrhous carcinoma of the breast was followed by deposits in the cervical vertebræ, the ribs, sternum, lung, and falx cerebri.

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[1] *Path. Soc. Trans.* vol. xxvii.

[2] Frederick Taylor, *Guy's Hospital Reports*, vol. xlix. p. 140; abstract of case.

T. Holmes relates another case, which both illustrates the extraordinary chronicity of severe cases of carcinoma, and also exemplifies that in the end metastases may occur in the osseous system, the spontaneous fractures afterwards uniting.

A woman, aged fifty-two, was in St. George's Hospital, supposed to be suffering from "rheumatism" about the left hip and thigh. As the limb was being manipulated it suddenly broke, and the lower fragment started up nearly under the skin. In about three months spontaneous fracture of several ribs was discovered on the left side, and then it was found for the first time that there was a small hard cancer in the right breast. This the patient had ignored or concealed for no less a period than thirty years! The patient died three months after the fracture of the femur; tubercles of carcinoma had meanwhile appeared in the skin of the thorax. The fractured femur had irregularly united by a dense mass of callus. The fractured bones were examined by the microscope, and the new deposit was almost exclusively "fibrous," nuclei being sparsely scattered here and there. The carcinoma in the breast was about the size of a walnut, and gave out under pressure a "creamy juice"; further details are wanting.[1] One of the best and earliest descriptions of cancer of the breast secondarily affecting the bones was given by Cæsar Hawkins.[2] He relates four remarkable cases in which the spinal column was affected. In one of them the right breast had been removed no less than six years before for carcinoma, the patient in the interval remaining well. He refers to the cases of Brodie and Green, and intimates that cancer of the spine is almost invariably secondary to breast carcinoma. Much has since been written on this subject, and the classical paper of Hawkins has hardly received the attention it merits.

Thrombosis of the deep veins, especially of the femoral, is sometimes seen in late cases of cancer of the breast. It is marked by agonising pain and œdema of the limb, with rigors and acute febrile symptoms. We need not be surprised at thrombosis occurring in cases where the circulation is feeble, the blood fibrinous, and where large "doses" of septic material are constantly gaining access to the circulation. Pulmonary embolism has also rarely taken place.

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[1] *Path. Soc. Trans.* vol. xi. p. 219.

[2] *Med.-Chir. Trans.* vol. xxiv. p. 45.

Attention will be drawn more formally in the chapter on recurrent cancer to the occasional return of the disease in the brain. The instance now related is inserted here to call attention to the fact that this is a possible source of death in cancer of the mamma with or without removal.

A woman, aged forty-seven, had the right mamma removed for scirrhus in 1882. Within two months of the operation she began to suffer from aching wearing pain in the lumbar region, and to become pale and thin. In February 1884 she was admitted to St. George's Hospital. There was an obtuse bend in the lumbar region, with very distinct pulsation of the abdominal aorta. There was severe epigastric pain, and both legs were slightly œdematous. After admission she had a succession of fits of an epileptiform nature, with convulsive twitchings of the left arm and leg. There was loss of sensation on the left side of the face, and hyperæsthesia of the left leg. At this time the diagnosis of hysteria was arrived at by some. In March severe thoracic pain with coughing and difficulty of breathing set in. She expectorated some watery mucus tinged with blood. In April some cancerous nodules appeared in the scar, which had hitherto been healthy. In July there was loss of power in the right arm. The convulsive fits recurred often, and she died in August.

The autopsy was made by myself. There were nodules of cancer on the right pleura, with deposits of scirrhus in both lungs and also in the liver. There were calculi in both kidneys, that in the left forming a large and obvious prominence. The third, fourth, and fifth ribs on the left side were so softened that they cut with a knife; they contained well-marked spheroidal carcinoma. On sawing the spine no trace of growth could be discovered. Over the right sylvian fissure there was a hard gristly plate of spheroidal-celled cancer growing upon the dura over an area the size of a five-shilling piece. The pains in the back and abdominal symptoms were thus due to unsuspected renal stones. The case affords a good instance of recurrent carcinoma affecting the cerebral centres, and also points to the possibility of relieving such cases by operation.

The principal causes of death in cancer of the mamma being thus exemplified, we must now pass on to consider the so-called *spontaneous cure of cancer*. It is of the utmost importance that the surgeon should be acquainted with the extraordinary variations sometimes observed in the clinical history of cancer of the breast, for upon the phenomena sometimes observed many erroneous plans of treatment have been founded; ignorant observers, or actual charlatans, founding their vaunted cures upon what may be termed the natural vagaries of the disease. There can be no doubt that many of the remarkable cases that are and have been observed in this connection are largely due to variations and alterations in vascular supply. This may be due to thrombosis or hæmorrhages or rupture of the newly-formed vessels leading to inflammation and actual sloughing, or to a general weakness of the circulation starving the growth by diminution of blood-supply. The improvement of cancerous sores after attacks of erysipelatous inflammation are well known.

Quite apart from apparent cure, and without explanation, sudden arrests or retrogressions of growth are observed, and whatever remedy is used at the time is sure to receive the credit for this, even in the estimation of medical men, who fall into our common error of attributing to drugs changes due to natural phenomena which we are not aware of. I may truly say that I have never seen a genuine case of spontaneous cure of cancer. I have witnessed remarkable cases of apparent improvement from sloughing, and have notes of striking cases of degeneration and atrophy. I have also seen cancerous tubers shrink and disappear under the dietary to be mentioned at the termination of this work. I have in such cases always observed a fresh outbreak of disease.

The atrophic withered cancer may, even after the lapse of ten or fourteen years, produce secondary metastases, especially in the bones, and the new growth may be as fibrous in its nature as the initial lesion.

All writers notice instances of atrophic or withering cancer. It is usually seen in old and spare persons, and its puckered cicatricial condition is beautifully shown in Fig. 47. Sometimes slight ulceration is observed, and part of it is often covered by a scab. The glands are very seldom affected. It is almost painless, and the general health does not suffer. These patients often do not seek advice until the disease has existed for many years, and consequently the surgeon must be especially cautious that internal metastases do not already exist. These are the cases of cancer upon which charlatans found their reputation, and in which I am bound to state members of the profession so often give erroneous opinions.

Bryant in his work relates an excellent and striking series of atrophic cancers, where the patients survived seventeen, fifteen, twenty, nine, and eight years. In one, secondary deposits of the skin disappeared and "fell off" from the fibrous contraction of the tumour.[1] Such experience is not singular. Gross devotes a considerable portion of his book on tumours of the mamma to this interesting class of cancer. He points out that though patients may live with atrophic scirrhus for a quarter of a century, yet visceral deposits are very frequent, and it ultimately invariably destroys life. The skin and fascia of the chest usually ultimately become extensively implicated, and so in the end are the axillary glands. He gives the average age of the affection at forty-seven. The average period of life in eight cases was no less than fourteen

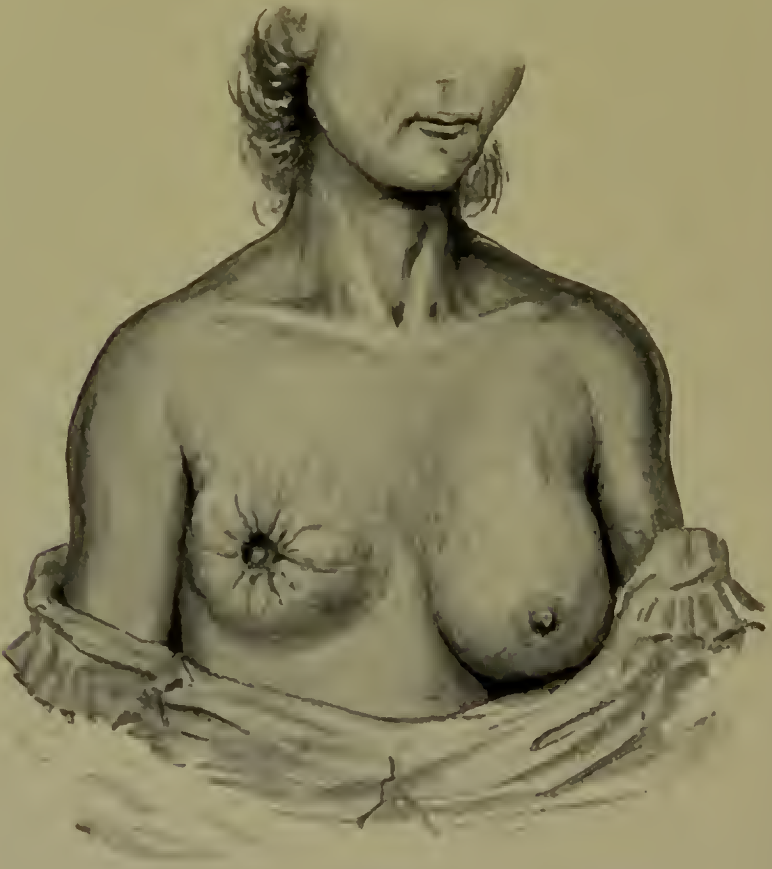

FIG. 47.—Atrophic carcinoma of right mamma which had existed for nine years.

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[1] *Diseases of the Breast*, p. 142 *et seq.*

years and nine months.[1] Personally, the cases I have observed of this affection have been principally in old women of seventy years of age and upwards, and notwithstanding the experience of Gross I am inclined to look upon it generally as the cancer of old age, though notable exceptions may be quoted to this rule. In my own experience the axillary glands have not been affected, though the disease had been present in the breast for years, and this is a very remarkable point, in a very curious malady.

The following cases show how atrophic cancer may exist for years in the mamma giving little local trouble, and yet finally may cause death from metastatic deposits.[2]

Greenhow[3] was consulted by a lady for a cancerous tumour of the liver and rapidly growing curvature of the spine. She had a small atrophic nodule of hard carcinoma in the right breast. No less a time than fifteen years before, she had been seen by Sir James Simpson and Syme for scirrhus of the right breast. No operation had been done, and she had enjoyed good health, believing herself cured of the malady which so long afterwards destroyed her.

At a meeting of the Pathological Society of London, 19th April 1862, the late Mr. Ernest Hart showed a drawing of a case of atrophic scirrhus of the breast in a lady aged seventy-five. The tumour had first shown itself twenty-four years ago, when the question of its removal was discussed. This lady having recently successfully undergone cataract extraction, had died from the severity of the weather. Mr. Nunn and Sir Spencer Wells, in referring to similar examples, spoke of the frequency of metastases of cancer in these cases, even after they have existed for years.

Professor Bennett of Dublin has kindly sent me details of the following truly extraordinary case, which he has himself observed. The patient was an elderly lady, a relative of his own, and the facts of the case are undoubted.

This lady first consulted Professor Bennett in the year 1866 regarding a tumour of the breast which had then existed since 1863. There were many enlarged glands in the axilla, and the tumour was slowly puckering the skin and ulcerating. The patient was under constant observation, and she died close on the age of ninety in 1886. She had thus borne the disease for twenty-three years. She never required any local treatment but cleanliness, and took no sedative.

A lady, aged forty-eight, about the year 1863 complained of pain and enlargement of the right breast. Two years after, the left breast became "indurated" and hard. Both breasts underwent a process of shrinking and contraction. The nipples were strangely puckered. In 1867, Sir James Paget declared the growth to be undoubtedly carcinoma. She died in five years of paraplegia with partial paralysis of the fifth and seventh cerebral nerves. This set in in 1867 with vague "neuralgic pains" supposed to be rheumatic. The report of the Morbid Growths Committee declares that the specimen to the naked eye closely resembled scirrhus. On examination, however, they discovered nothing but fibrous tissue; no cells could be discovered. The meninges of the cord and brain were enormously thickened at certain localities by a similar growth, which pressed upon the nerve tissue and produced the symptoms mentioned.[1]

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[1] *Tumours of the Mammary Gland*, p. 181.

[2] Pathologists have supposed that this strange retraction was a means employed by nature to bring about the cure and isolation of occult cancer. Unfortunately this is only a pleasing dream. Velpeau, *Diseases of Breast*, p. 349.

[3] *Path. Soc. Trans.* vol. xxv. p. 367.

It cannot be too clearly pointed out that the atrophic process may attack individual tubercles of cancer, which may wither and disappear, while fresh ones form in other localities. This happened markedly in one of Bryant's cases, and Nunn[2] notices the spontaneous disappearance of individual tubercles of cancer which had recurred in a scar.

In the year 1886, I had a case of recurrent cancer under my care, where this curious phenomena twice happened. The patient insisted on taking the "Mattei remedies," to which the changes were, of course, erroneously attributed. They did not influence the process of cancer of the liver and peritoneum from which she was rapidly sinking.

Dr. Stradling of Watford, Herts, has now (1896) under his care a lady who had the left breast operated upon for undoubted cancer as proved by the microscope. This was in 1883. Two years after, the disease returned in the opposite breast. She declined further operation, but took the powder of calcined oyster-shells, then recommended by the late Dr. Peter Hood (!)

The patient has, fourteen years after the first operation, now no trace of the disease, the right breast being withered, atrophic, and shrunken. The nature of the recurrent disease was clinically quite clear, and it is a remarkable instance of the atrophic changes which sometimes occur in these cases. We can hardly suppose that the treatment employed had anything to do with the matter.

Mr. Gould brought before the Clinical Society of London, 27th November 1896, a truly remarkable case of spontaneous disappearance of cancer. In May 1890 the breast was amputated for a tumour (carcinoma ?). In 1892 a carcinomatous recurrence was removed from the axilla. In 1894 she had lumps in the scar, and also one above the opposite right breast. All these were removed. In 1894 she came again with fresh recurrences in the scar, and suffering from dyspnœa. In 1896 she was admitted to the cancer wards of the Middlesex Hospital. There were scattered tubercles in the skin about the scar, enlarged supra-clavicular glands, and also enlarged glands in the right axilla. She could only breathe sitting up, and the right chest was dull up to the scapula. There was a growth, apparently cancerous, below the left trochanter. This was in March. In June, Mr. Gould again examined and found that the glands had gone, and that there was hardly any dyspnœa. The dulness had disappeared except at the extreme right base. She could stand on the left leg, which was markedly shortened, but the swelling was less than before. She had steadily improved since. Microscopical examination of two of the previous specimens showed "scirrhous" cancer. There was no treatment employed which could have inflamed the growth.

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[1] For full details of this important case, which is supposed to be one of hard cancer which had undergone spontaneous cure, see *Path. Soc. Trans.* vol. xx. p. 349.

[2] *Clin. Soc. Trans.* vol. vi.

Now, had such remedies as those of Mattei been employed in this case, one can easily understand what would have been thought and said by the ignorant.

At the same meeting Mr. Bowlby mentioned a case under his notice, where recurrence took place after breast carcinoma; the local conditions were those of "cancer en cuirasse." Six months ago the liver enlarged, and the patient became jaundiced and emaciated. She was now in the country. The lumps in the skin had disappeared. The liver is no longer enlarged; she is free from jaundice, and gaining weight. There had been a subsidence of the manifestations to the amount of "nine-tenths."

"Spontaneous Cure" by Sloughing.—It is easy to understand how from interference with vascular supply or inflammation, masses of exuberant cancer may undergo gangrene and slough away. This happens in all parts, especially the uterus and larynx. In the latter situation the most extraordinary temporary improvement may from time to time occur, leading to false hope for recovery, and shaking expressed opinions of the cancerous nature of the disease. The patient getting rid of a source of sepsis and hæmorrhage not infrequently literally takes a new lease of life, and the parts may even partially cicatrise. On such cases charlatans build up the foundations of their caustic treatment, and surgeons and physicians wreck their prognostic reputation. These curious cases are in the knowledge of many practitioners of experience, but they are very uncommon.

Nunn[1] relates the case of a dressmaker, aged seventy-two, where a scirrhus of the breast, which had been under observation for four years, twice sloughed out spontaneously, leaving a cavity which became covered by a kind of delicate cicatrisation.

A case of sloughing scirrhus of a striking nature is related by Warren.[2] A woman, aged thirty-nine, had an enormous mass of scirrhus in the breast, with envolvement of the axillary glands. Warren saw her in 1836. In 1837, for no known cause the mass became gangrenous and "was in a fair way to slough off." "She has a hope of a favourable termination of this unusual attack."

As long ago as the year 1803 the phenomena of spontaneous sloughing was observed. The case is recorded of a woman, aged fifty-eight, who bore a large cancerous breast of a year's standing, which ulcerated in the centre. The disease was considered too extensive to operate upon. It became attacked with gangrene and sloughed out, leaving a cavity the size of a common saucer. From that time a surprising improvement in health and spirits occurred, and the ulcer commenced to cicatrise rapidly. The disease, however, returned in the axilla, and proved fatal.[3]

Simon[4] relates a case where a scirrhous tumour the size of an orange, in the left breast of a woman of thirty-six, disappeared entirely under the constant application of ice for thirty-four days. We can hardly doubt the genuineness of this case, for in nine months she returned with cancerous tubercles in the skin round the mamma, and general malignant disease.

Ashurst[5] relates a sarcomatous ulcer of breast which had healed.

Such cases as these might be multiplied, though the very exceptional nature of them in actual practice must clearly be understood. The possibility of their occurrence will exemplify the caution in prognosis we should always exercise concerning cases, the pathology of which is far from clear, and which may even seem clinically doomed to speedy dissolution. Indeed, cases of carcinoma strongly remind us of cases of tuberculosis. The most desperate symptoms about the joints or lungs will sometimes improve. An apparently dying patient may make so strange and unexpected an improvement, as greatly to damage the prognostic reputation of the too confident physician, who founds his opinions wholly on pathological grounds.

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[1] *Clin. Soc. Trans.* vol. xi. p. 100.

[2] *Surgical Observations on Tumours*, p. 275.

[3] *Med. and Phys. Journ.* London, vol. x. p. 451.

[4] *Path. Soc. Trans.* vol. v. p. 311.

[5] *Trans. Path. Soc.* Philadelphia, vol. v. p. 230.

CHAPTER IX

ON THE DIAGNOSIS OF CANCER OF THE MAMMA FROM THE VARIOUS CONDITIONS WHICH SIMULATE IT

Age—Appearance—History and family history—Pain—Illustrative cases of insidious origin—Appearance of mamma, of skin and nipple—Various causes of retracted nipple—Absence of retraction, or skin implication, in certain cases—Submammary cancer—Method of examination with the hand—Mobility of carcinoma in fat—Weight of hard carcinoma—Diagnostic import of enlarged axillary glands—Exploratory incision—Peculiar varieties of carcinoma as cancerous cysts, villous duct cancer, etc.—Diagnosis of cancer from phantom tumours, fibro-adenomata, chronic mastitis, cysts, and abscesses, with additional illustrative cases.

Any one who has read the preceding chapters will be aware of the fact that cancer of the breast may be simulated by various kinds of tumours and inflammatory conditions. In the present chapter an attempt will be made to recapitulate the essential diagnostic points, and to present to the reader in a concentrated form all the principal conditions that may give rise to doubt. It is difficult here to avoid a tendency to repetition, and the importance of the subject must serve as an apology. The leading symptoms of carcinoma of the mamma are tolerably familiar, and a narration of them is principally of importance in order to give to each its full clinical significance. I have thought well in this chapter to include the subject of cancerous cysts, as their diagnosis is of the utmost importance, and even overwhelms the interest of their pathology.

Age.—The patient will probably be over thirty years of age. A glance at the age tables (p. 287) will show that cancer is rare under the age of thirty, and most common between forty and sixty. Here the observer must avoid falling into the common error, of assuming that a tumour in the breast of an elderly woman, is of necessity carcinomatous.

Appearance of Patient.—This is seldom characteristic, and I would advise no stress to be laid upon "anxiety of face," "cachexia," "emaciation," which conditions are seldom present in early cancer. This disease may often be found in fat, florid, and healthy-looking individuals. Indeed the patients look much like other women of their age.

History.—An examination of cases at St. George's Hospital showed an extraordinary variation in the time the tumours had been noted, varying from two years to a few weeks. No fixed rules can be laid down upon this point. In most cases the tumour is noted quite accidentally, or attention is drawn to it by some passing pain or "twinge," often thought to be "rheumatic." The one important point regarding the history is this. If the tumour should have existed for twelve months or more, and have considerably increased in size, the probability of metastasis in the bones, liver, lungs, or other parts is seriously advanced. This important consideration is too often overlooked in practice, and in the consideration of a case of carcinoma which has existed for any length of time, what may be termed a "medical" examination of the patient should never be neglected. Especial attention should be paid to the lungs and pleura, to the liver, and to any vague pains about the bones or limbs termed by the patient "rheumatic" or "neuralgic." For want of these obvious precautions, I have known extensive operations to be done for carcinoma, when dissemination had already occurred in other parts of the body.

Antecedent History.—I have already thrown some doubts as to the frequency with which antecedent mastitis is a precursor of cancer. The fact is, many women have slight mastitis or microscopical epithelial irritative changes, and comparatively few have cancer, and we hear of the cancerous cases, but not of the many who escape. Sore and congenitally contracted nipples seem especially connected with the after-development of cancer. All authors notice this association, and "percentages" are given of the numbers of cases of carcinoma which have had antecedent sore or retracted nipples.

A reference to p. 294 will show the reader the really small percentage of cases, where antecedent history of blows, mastitis, or mammary abscess seems indubitably to precede the growth of cancer. Regarding a history of traumatism, the surgeon will do well to take into consideration only what he himself thinks is likely to be true. Statistics founded on the statements of hospital patients are in my judgment hardly worth seriously considering. Slight knocks and contusions of the mamma in the lower classes are sufficiently common, and if a woman finds a tumour in her breast, she is only too likely to attribute it to some injury.

The development of malignant disease after injuries is a generally established fact in pathology, and is as true of the breast as of other parts. A severe blow, followed by bruising and blood extravasation, will be followed by considerable local induration, and the surgeon must not too hastily assume that this is cancerous. Any sign of bruising should lead to treatment by mercurials and pressure. Cancer may originate some months after the injury, but if this happens, the induration will gradually increase, putting on the characteristic features of the malady.

The diagnostic conclusions regarding blows and antecedent inflammatory conditions, especially sore and retracted nipples, amount to this. The surgeon may hold in his mind that such conditions are likely to be precursors of cancer, and such evidence will be thrown into the scale on the side of a given tumour being cancerous. It is in no sense to be regarded with implicit reliance. Chronic abscess, for instance, is especially apt to be associated with bygone history of suppuration or mastitis, and with sore nipples.

Family History.—In the chapter on the causation of cancer, I have already written upon this subject and the numerous fallacies which surround it. I would conclude, that if there be a strong family history of cancer, many individuals having died of the malady, I would consider such evidence worth taking into diagnostic consideration. As "clinching" a diagnosis, the question of family history is useless. There is nothing, for instance, to prevent a member of a cancerous family having a cyst in the breast, or a chronic abscess, or a hard adenomatous tumour. The more the surgeon relies upon what he sees and feels, and the less upon what he hears, the more likely is his diagnosis and therefore his treatment to be correct.

Pain.—It cannot be too strongly pointed out, that pain is not as a rule a leading symptom of early cancer of the breast. Cases will be presently related to show that cancer may exist in the mamma, especially in very fat women, without the patient being even aware of its existence. Indeed, such conditions as cancerous pleurisy, paraplegia, or the sudden appearance of mysterious "button-like" tumours all over the integument of the thorax, may for the first time draw the attention of the surgeon to the fact that a cancer has long lain unsuspected in the mamma. When the growth advances and nerves are involved, the pain of a "shooting," "darting," or "burning" nature is peculiarly distressing, but the diagnosis is then seldom doubtful. In like manner an early cancer, unless inflamed, is rarely tender to the touch. Local tenderness, with much pain, especially of a throbbing nature, should always lead a judicious practitioner to suspect some inflammatory origin in a deeply-seated mammary tumour, even though it feels hard and formidable. Such a swelling may readily be an abscess with thick walls or a suppurating cyst.

There is, however, one pain symptom in early cancer which I believe is of clinical import. This is a slight twinge or pang like an electric shock or the prick of a needle, which is experienced round the thorax, or down the arm of the affected side. I have frequently seen this symptom attributed to "dyspepsia," "intercostal neuralgia," or "rheumatism." A careful examination of the breast should never be neglected when an elderly woman complains of this phenomenon. I regard this as the one important "pain symptom" in early cancer. But in perhaps the majority of cases early cancer of the breast is quite unnoticed, the patient finding the tumour accidentally.

It is especially in very fat women that carcinoma of the breast is apt to remain unnoticed in its earlier stages, and indeed the dimple in the skin over the growth may first attract the attention of the patient. The consideration that early carcinoma may escape detection, explains those most important cases, in which the secondary effects of the disease, in producing deposits of growths in other parts, become more noticeable and prominent than the primary. Thus a case of pleurisy in an elderly woman, coming on insidiously, may be due to a deeply-seated nodule of cancer in the breast, and the same may be said of pains about the thorax or bones, often supposed to be "rheumatic." Of still greater importance are the phenomena of spontaneous fracture, especially of the femur, or severe pains in the spine terminating in paraplegia, and the sudden and rapid appearance of innumerable disc-shaped nodules of cancer over the skin of the thorax and abdomen. In all such cases as these I would advise examination of the breasts, and in a certain proportion of them a nodule of deeply-seated carcinoma will explain a very mysterious illness. The brief notes of the following cases will illustrate these diagnostic points—which are of the utmost importance in clinical medicine and surgery—better than I can express them.

Scirrhus in the Breast of a very Fat Woman merely marked by a Dimple in the Skin.—This patient formed the subject of consultation at St. George's Hospital on 15th June 1894. On the inner side of the left nipple was a deep dimple or pucker in the skin of an enormously fat mamma. There was an ill-defined swelling deep beneath, which, however, lacked the peculiar hardness of scirrhus. The nipple was not retracted, and there were no enlarged axillary glands. The patient stated that she had noticed the dimple in the skin for about three months, having previously struck the part against a chair. Great differences of opinion were expressed as to the true nature of the case, owing to the amount of fat preventing the proper palpation of the deeper parts. An exploratory incision, after dividing much fat, revealed a definite nodule of scirrhus the size of a haricot bean, and the whole mamma was removed.

Scirrhus of Breast: Secondary Growth of Spine.—A woman, aged fifty-six, was admitted into St. George's Hospital on 27th June 1894. Six months before admission she felt pain and stiffness in the lower part of the back, also severe pains in the knees, supposed to be due to "rheumatism." For the last month she had suffered from agonising "girdle pains," and could hardly be moved without excessive suffering. Two months only before admission she noticed a retraction of the right nipple, and thus her attention was first called to a tumour growing in the breast. In the right breast there was a scirrhous cancer, with the usual clinical characteristics. There was great pain and tenderness over the lower dorsal spine, but no motor or sensory paralysis of the legs. The urine had to be drawn by a catheter, and was alkaline. She remained in the hospital for about four

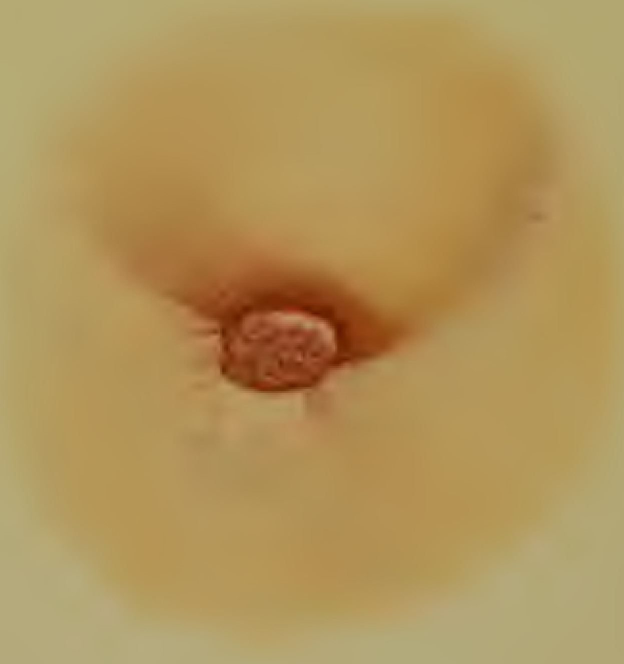

PLATE XIII.

Retraction of the nipple in hard carcinoma of the mamma.

To face p

months, emaciating rapidly, and pain being relieved with morphine. She died apparently exhausted on 18th November. No post-mortem examination was made.

A case is also related in vol. xiii. of the *Pathological Society's Transactions*, where a lady, aged fifty-five, suffered severe pain in the lumbar region and in the knee of a very excruciating nature, with retention of urine and fæces. She was seen and examined by at least ten physicians and surgeons, but none of them suspected the true nature of her case until five months before her death, when scirrhous cancer was found in the breast.

Patients with cancer of the breast will sometimes conceal the disease even when far advanced.

A woman, aged sixty, consulted a physician of repute for hepatic pain, and a hard nodulated tumour could be felt in the liver, with œdema of both ankles and ascites. The patient died in about a month. At the necropsy carcinoma of the liver was discovered, and to the surprise of friends and medical attendants, it was found for the first time, that the patient was also suffering from cancer of the breast, which she had successfully concealed, even from friends and relatives.[1]

The above instances may serve to show the practitioner how insidious carcinoma of the breast may be in its early stages, and how, indeed, instead of being a source of agonising pain to the patient, it may be ignored, overlooked, or wilfully concealed. The latter condition is only too common among women of the upper classes, and I cannot too strongly impress this fact upon those who have large family practices, upon whom the responsibility of the early diagnosis of these cases rests.

Appearance of the Breast.—In early carcinoma and in large mammæ, there may be no appearance of an important nature. If the tumour be of any size, and has commenced to contract, the affected breast may actually be smaller and flatter than the other. In a large proportion of the cases, the skin is obviously dimpled, and there is no sign of more vital import than this. The slightest dimple on the skin of the mamma of an elderly woman, is a dangerous symptom which cannot be ignored or neglected by any medical man. It must be very clearly pointed out, that this dimpling of the skin is not due to adhesions between the actual tumour and the skin, but to contracting or drawing down of the fibrous processes which radiate from the skin to the mammary tissue. It is, therefore, generally present even in deeply-seated tumours.

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[1] *Path. Soc. Trans.* vol. xxvi.

In other cases, the skin is actually infiltrated by the growth, is dusky, congested, or livid, and has that coarse pitted aspect to which the terms "peau d'orange" and "pigskin saddle" appearance have been well applied. The nipple is retracted in the majority of cases of scirrhus of the breast. The importance of this symptom is well exemplified in the

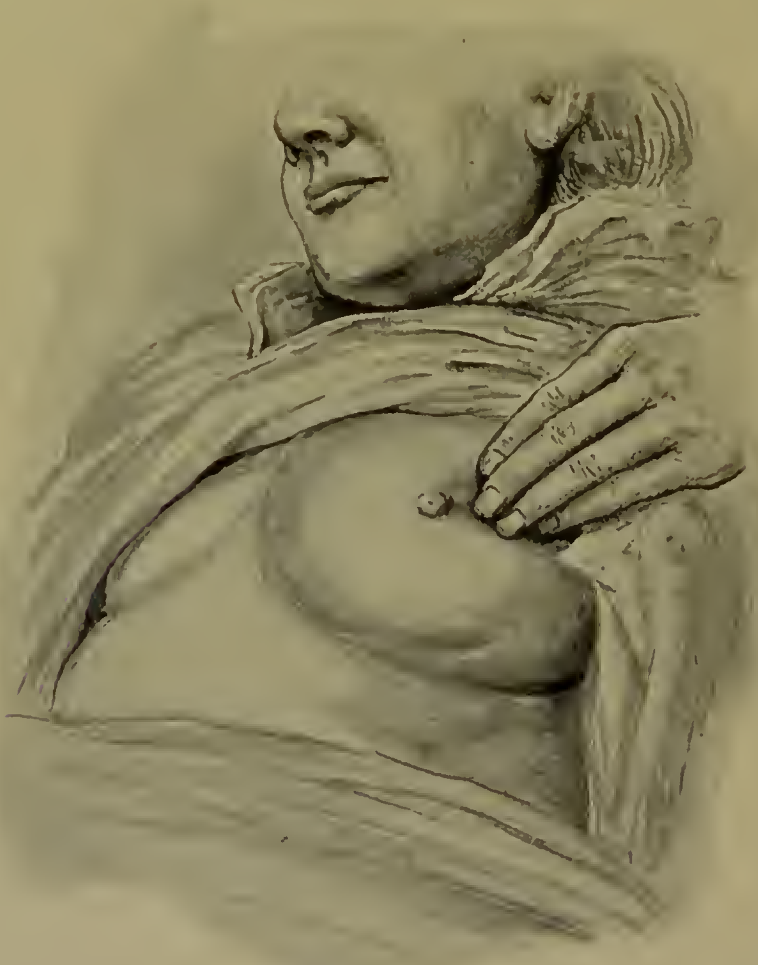

FIG. 48.—The dimple in the skin over early carcinoma in the lower part of the breast.

400 St. George's cases, where the nipple alone was retracted in 81 instances, the nipple and skin together in 186 cases, the skin alone in 80 cases. Thus in 347 out of 400 cases, the nipple and skin, alone or together, were implicated, by retraction, puckering, ulceration, and the like.

It has been pointed out that in large sarcomatous tumours the nipple may appear retracted, when this is not really so, owing to the tumours pushing forward the parts round it. Hence some little care should be taken in investigating the symptom, to be sure that retraction is real, not apparent.

Many other conditions besides contracting carcinoma may pucker the nipple, and these may be thus tabulated:—

(1) The nipple may be retracted from congenital imperfections.

(2) From all varieties of chronic inflammations, old abscess, or incisions of operations.

(3) Rarely from a shrivelled cyst.

The various conditions which produce this symptom thus weaken its diagnostic importance. Yet if a tumour form in the breast deep to the nipple, and the latter be progressively retracted towards it, such a tumour can hardly be anything else but a carcinoma.

Furthermore, the areola may show the rare appearance of "dermatitis maligna," and some amount of soreness and eczematous crusts about the base of the nipple are sufficiently common in carcinoma to be of diagnostic import. The veins over a carcinoma may be enlarged, but this symptom is not marked unless in very rapid formation of soft malignant growths. Regarding small telangiectatic spots of a bright crimson (Taches De Morgan) and pedunculated fibromata of the skin, or pigmented warts, these are common in aged persons whether cancer exist or no. I have often seen them, and can find no evidence that they are more than mere coincidences. When a carcinomatous tumour has attained the size of an orange or a hen's egg, the appearances are so evident, that there is little difficulty in the case: the skin is markedly implicated, and one or more livid tubers of the disease usually show themselves. Should the integument be ulcerated, the margins of the ulcer are invariably of a dull livid blue, or red, hard, indurated, and adherent to the parts beneath, the granulations are scanty, the discharge fœtid, and the sore often concealed beneath a firm scab.

I know of no condition, which produces the peculiar dimple of the skin over contracting carcinoma, unless it be the puckering about an old sinus or a contracting cyst or abscess; yet in the more rapidly growing varieties of carcinoma, which do not contract, and in very deeply-seated nodules of carcinoma, this symptom may be quite absent. The fact that deeply-situated cancer may not pucker the skin over it in the least, is well illustrated by the following cases:—

A woman, aged sixty-three, was admitted into St. George's Hospital on 5th June 1895, and was the subject of consultation, on account of a deeply-seated tumour the size of a walnut in the right mamma. She was the mother of four children, but could not suckle with the right breast on account of a poorly-developed nipple. She had noticed the tumour for five or six weeks. The growth was deeply situated in the upper part of the right breast. The nipple was not retracted; the skin was not implicated in any way. On pressure over the growth a sense of elasticity was elicited, and most of the opinions were rather in favour of it being a cyst. On 6th June an exploratory incision was made by Mr. Pick. The tumour

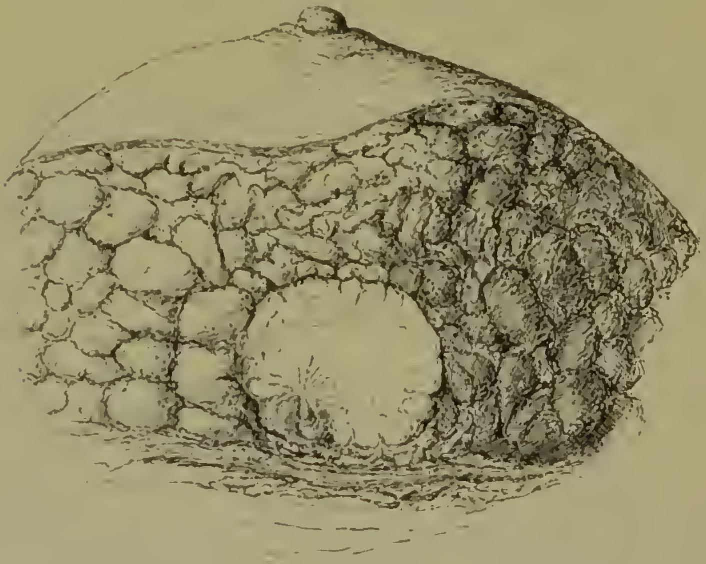

FIG. 49.—Submammary carcinoma. The skin is not dimpled, the nipple is not retracted.

was a firm carcinoma, but devoid of the hardness and contraction of scirrhus. It lay upon the pectoral fascia in the deeper layer of mammary tissue.

In the year 1892, I operated upon a patient aged forty-five, who had a "lump" the size of a pigeon's egg deeply seated in a voluminous mamma. The skin and nipple were quite unaffected. This patient had seen many surgeons, and the opinion that the tumour was a cyst had been pretty generally expressed. On exploratory incision, a nodule of cancer was found lying incorporated with the pectoral fascia. This variety may well be termed submammary carcinoma, and I do not see how it can be certainly diagnosed, unless by exploration.

In 1894 I assisted a colleague in a very similar case. His patient had seen many surgeons, and a diversity of opinions had been expressed, but a nodule of cancer was found in the deeper layers of the mamma. I believe that in these instances, the growth is developed in one of the outlying lobules of mammary tissue, which are submammary and may penetrate the pectoral fascia. The condition is rare, but very important.

A woman, aged sixty-six, came into St. George's Hospital on 24th June 1869, under Mr. Holmes' care. She was moribund when admitted, and died shortly afterwards. The right arm was œdematous. At the post-mortem, on reflecting the skin from the chest, a large carcinomatous growth was found implicating the pectoral muscles and not involving the mamma, which lay over it, and was both to the naked eye and microscopically, natural in structure. The pleural surfaces of the walls of the chest were studded over with nodules of cancer. The right pleural cavity was full of pus. It seems highly probable in this case, that the growth began in a submammary lobule.[1]

Examination with the Hand.—It is by this means that the diagnosis of carcinoma in the early stages is generally settled, and a word may here be said on the proper method of conducting this important proceeding. The thorax should be quite undressed, and the patient should recline on a sofa or easy-chair. The suspected breast should be examined with the "flat" of the fingers, and never only by "pinching up" portions of breast-tissue between the thumb and finger. In marked cases of the usual carcinoma the deposit is as hard as a piece of wood, its outlines are somewhat obtuse, seldom perfectly rounded, and the surrounding breast-tissue is attached to, and moves with it, the greatest hardness being towards the centre.

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[1] P.M. and Case Book, St. George's Hospital, 1869. Castex, in an excellent article on mammary abscess and congestions (in the *Revue de Chirurgie*, 1887) points out that the dimpled skin "peau d'orange" is by no means absolutely diagnostic of cancer, and he quotes Gosselin and Reclus as being of the same opinion.

In early periods of the malady with which we are now especially concerned, the nodule of disease may not be larger than a haricot bean, yet the hardness will usually be very striking and evident.

Immobility, incorporation, and adhesion to the surrounding breast substance, are leading and reliable signs of hard, contracting carcinoma.

In very fat breasts, the tyro must be especially warned, that a small nodule of scirrhus may be strangely and deceptively mobile, since it is practically surrounded by a semifluid medium. I cannot too strongly urge upon my readers this important point, for I have seen several errors committed in consequence of ignoring it. The dimple in the skin is, however, generally found in these cases. The surgeon may finally press firmly upon the centre of the tumour with the sentient pulp of his index-finger, and any sign of elasticity, or yielding, should at once make him suspicious of a cyst, or deeply-seated abscess with thick walls. When thus pressing, he watches the nipple closely, and if a dark bloody discharge issues forth, which is not uncommon, he knows he has to deal with a cystic formation. Such a symptom is found in the villous variety of "duct cancer," and not unknown in hard carcinomata. It was noted in about 6 per cent of the St. George's cases.

All parts of the breast should be examined. Carcinoma is practically always single, and the mere fact of finding more than one tumour in the same breast is rather against cancer. Here it may ever be distinctly borne in mind, that there is nothing to prevent cancer existing with an old adenoma, or a cyst of independent origin, and " duct cancers " are sometimes multiple.

The opposite breast should now be examined carefully, for double carcinoma is not unknown.

Finally, the mobility of the growth on the pectoral muscle should be carefully tested in all positions of the arm. If the arm be raised, and the pectoral muscle rendered tense, immobility of the tumour in the direction of the muscular fibres is often rendered very apparent. It is absolutely essential that a methodical examination of this kind be conducted, or the surgeon will, to his chagrin and confusion, find conditions at the operation, which perhaps necessitate measures the exact opposite to which he has explained to the patient, and a circle of anxious relatives.

Weight of Scirrhus.—If the mammæ are pendulous, this symptom should always be investigated, and I regard it as an important one. The increased weight of a breast affected by cancer is very striking, and we have had several instances of this at our consultations at St. George's, where we are accustomed to place some value upon the investigation when it can be carried out.

Examination of the Axilla, Diagnostic Import of Enlarged Glands.—Many directions are given for the examination of the axilla, and if the arm be brought to the side in a spare woman, enlarged glands may possibly be detected. I feel convinced that the only certain way to examine the condition of the glands is through an incision, and this is especially needful in obese women. But what examination, however conducted, can detect microscopic clusters of infective cells in the glands? Now that the removal of the glands in the axilla has become a common rule in practice, the importance of detection of enlarged glands prior to operation has much lessened in importance. The hard glands of cancer are well known. If they are present, they are strong evidence in favour of the primary focus being cancerous. If they are apparently not enlarged, as is often the case in early carcinoma, their absence does not prove innocency. Enlarged axillary glands in connection with mammary affections are common, and the subject may thus be presented in a tabular form.

Axillary glands, enlarged and tender.	Acute and chronic mastitis.
	Abscess and tubercular affections.
	Syphilitic chancres of nipple or areola.
	Skin affections, as eczema.
	Innocent tumours, as adenomata and cysts from inflammatory irritation, or excessive handling.

Axillary glands, enlarged, hard, not tender, with a tendency to fixation.	Carcinoma. Sarcoma (rarely). As the result of old inflammation, previous attacks of mastitis. Tubercular disease.

Tuberculous Axillary Glands.—It may be thought impossible that this condition could be confounded with carcinoma of the mamma, yet I have twice known this error to be committed. In both cases the cancer had developed in an axillary lobule of the breast, and the resulting tumours and extensive glandular contamination were apparently quite free of the mamma, which felt smooth and healthy. These cases are very deceptive, and in axillary growths in elderly women the greatest care should be taken to examine the margin of the breast, where a primary nodule may be detected.

The axillary glands may enlarge in cancer of the breast and afterwards subside. Clearly some inflammatory irritant has then gained access to them. This may be seen in ulcerating carcinoma, where, in addition to the cancerous elements, septic organisms easily enter the lymphatic channels, and in such cases an axillary abscess may even form. Precisely the same phenomena are observed, in cancerous involvement of the cervical glands from ulcerating epithelioma of the tongue. I have seen irritative enlargement of the axillary glands caused by the excessive handling of a tumour, and certainly by painting it with tincture of iodine.

Almost every writer on mammary diseases gives comparative estimates of the frequency with which the lymphatic glands are infected on the case first coming under observation. Gross puts gland infection as high as 64 per cent. I have taken especial care to investigate this subject in the St. George's cases, and I believe the observation is a valuable one, for all the registrars seemed careful to remark upon the presence or absence of this symptom. It was present in nearly 50 per cent. I made this observation in accordance with custom. It is probably pretty accurate so far as "the being able to feel" cancerous glands is concerned. I do not believe, however, that any such observations are of real value or importance. Without slicing the glands and examining them carefully with the microscope, it is impossible to tell whether small cancerous deposits are present in them or not. Were this done methodically in all cases of mammary carcinoma, I believe the proportion of implication would be far higher than the above figures show, infection by "showers" of small cells in the axillary fat being so frequent and remarkable.

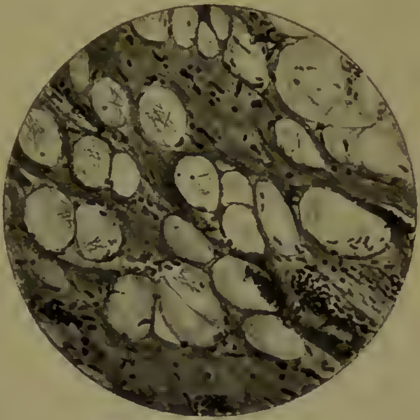
FIG. 50. Axillary fat infected by carcinomatous cells.

It may here be remarked that in thin women the transverse processes of the lower cervical vertebra project markedly in the sub-clavian triangle, and are very apt to be mistaken for enlarged cancerous glands above the clavicle. I have known this natural conformation mislead even experienced surgeons. Masses of fat are sometimes seen at the root of the neck in women. They may be sub-fascial, and then closely resemble glandular enlargement. This is also a situation where strange muscular contractions, simulating tumours, are apt to be found.

General Résumé of the Symptoms of Carcinoma.—By careful consideration and local examination, the diagnosis of carcinoma can generally be certainly made, some of the more trustworthy signs of the malady being prominently present. Were I asked the symptoms of the disorder upon which I should principally rely, I should reply, marked hardness, a somewhat square outline, implication of the skin, and immobility. In practice, however, cases are not uncommonly met with where the diagnosis is extremely difficult. Such a case as is exemplified in Fig. 49, p. 348, for instance, could hardly be certainly diagnosed by any means short of exploratory incision. Again, some cysts and abscesses are so hard and fixed that they may deceive even expert observers. For my own part, I make it a rule to cut into all tumours of the breast before removing the organ, and I believe this is a safe line of practice to inculcate.

Any one who has had large surgical experience, if he told the truth, would have to confess to diagnostic errors in cases of mammary carcinoma, and only those devoid of that experience, will be ready to give confident opinions upon these cases without exploration and inspection.

Exploratory Incision.—Those who are fully alive to the many difficulties which surround the diagnosis of carcinoma of the breast, will more and more rely upon this method, which alone has a close approach to certainty. The incision should be tolerably free, so that the cut surface can be everted, sponged, and thoroughly looked at. The supposed tumour must be cut into deeply, for some cysts have extraordinarily thick walls.

I make it a rule also to mark the site of a slight induration, which is to be explored by incision, with an indelible pencil, while the patient is able to point it out. In very voluminous breasts, when the patient is insensible, I have seen the surgeon fail to find the suspicious patch, or even to be in doubt which breast was actually affected. Such a predicament is always awkward and sometimes discreditable, and can be avoided with certainty by adopting the above simple precaution.

The peculiar hardness and density of even a small carcinomatous nodule is peculiarly evident on section. A larger mass may creak slightly from excess of fibrous tissue, and its cut surface becomes concave. Neither of these two latter phenomena is at all invariable. The cut surface is white, glistening, and marked by minute puncta of a yellow colour, from which, on squeezing, abundant creamy juice and small yellow plugs of cellular débris escape. The likeness to a section of an unripe pear is very close. The surrounding breast substance, is drawn and puckered towards the central focus by white and radiating fibrous bands, in a very remarkable and characteristic way. The adjacent Plate illustrates well the appearances shown by a section of hard cancer, which are so important from a diagnostic point of view, that they cannot be too closely studied. In small doubtful "indurations," where the exploratory incision is so needful and useful, the surgeon may still be in doubt. If in the centre of the induration

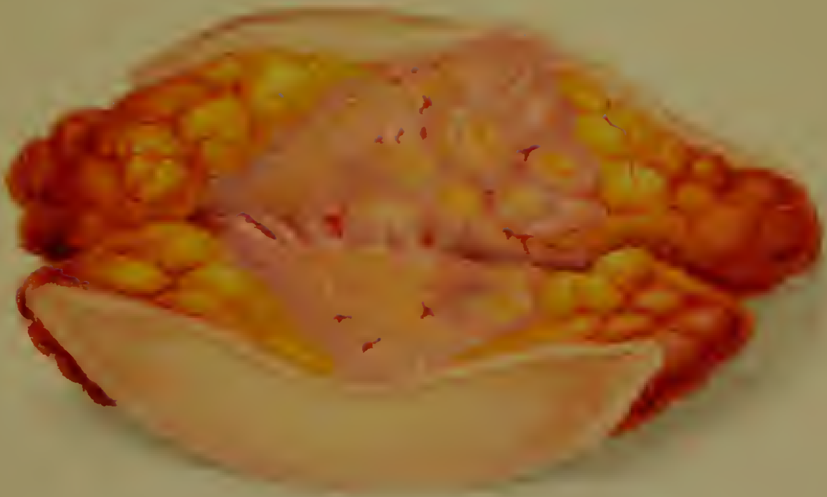

PLATE XIV.

Appearance of freshly-cut hard sarcoma, as in exploratory incision. From a painting in the collection of the late Mr. Cæsar Hawkins.

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there is a hard nodule, even the size of a split pea or shirt button, to which by radiating contraction the surrounding mammary substance is drawn and incorporated, such a nodule will, in a woman of over thirty years of age, invariably be cancerous, and in such cases very complete removal of the mamma and lymphatic contents of the axilla, will give the best results as to permanent freedom from recurrence.

I have already remarked that I would lay as much stress upon the naked-eye appearances, the peculiar hardness on section of a cancerous nodule, as I would upon microscopical evidences of proliferative changes in the epithelium. I am aware that this statement is open to criticism by experts in pathology, and have not made it hurriedly nor without a due belief in its accuracy. The hardness can be well appreciated by palpation with the pulp of the index-finger. When exploratory incision is advised, the whole responsibility of whether the entire breast is to be removed or not, must be left in the hands of the surgeon. In practice, this is not always possible to obtain. The surgeon may then explore, in the hopes of finding a cyst, which he can deal with by local measures. If he finds carcinoma, it has been advised by some to remove a wedge-shaped portion of the mamma with the growth. Such treatment I do not recommend, and it is only justifiable if insisted upon by patients and their relatives, who must then take the consequences of their own ignorance and folly; but no surgeon has, in my judgment, a right to remove the entire mamma without the explicit permission of the patient.

Careful attention to the foregoing remarks and principles of diagnosis, will enable a surgeon in the vast majority of cases, to give a confident opinion regarding any case of carcinoma of the breast which is brought to him. To make this subject complete, I now propose to point out certain exceptional varieties of primary carcinoma, with remarks upon their diagnosis, since it is in these cases that difficulties and mistakes most commonly arise.

PECULIAR VARIETIES OF CARCINOMA

Infiltrating Carcinoma.—This is an exceptional variety of the disease, and is peculiarly likely to be confounded with chronic inflammation. Knots and nodules of cancer are disseminated through the breast substance, and they feel as though they were distinct, though really they are connected by indurated and infected lymphatic tracts. On palpation with the flat of the fingers, definite hard deposits will invariably be felt, and, above all, I have never seen one of these cases in which the skin was not somewhere adherent, being drawn down by a slight dimple at one spot. The nipple is frequently deeply retracted. I have generally seen this variety in comparatively young women with large and vascular mammæ. If the skin be congested and there be increase of local heat, the similarity to inflammation is most close.

A remarkable instance of this variety of the disease was brought forward, at our weekly consultations at St. George's on 23rd September 1896:—

The patient was a stout, florid, healthy-looking woman, aged thirty-five, the mother of four children. She had inflammation and suppuration of the right mamma ten years ago, and the abscess was opened near the nipple, which was not retracted. She had noticed the present affection of the breast for about four months. There was an ill-defined hardness rather than a tumour towards the axillary aspect of the mamma. On pinching up the tissue numerous tumour-like formations could be felt. On examining with the flat of the hand many of these disappeared, but three or more became still evident, and were plainly connected by cores or strings of indurated tissue. There was a distinct dimple or "cupping" of the integument at one spot, and upon this symptom most of us gave an opinion that the disease was carcinoma. The axillary glands could not be felt. The breast was distinctly heavier than the opposite gland. The similarity of this case to chronic mastitis was exceedingly close, and personally, the being able to feel distinct nodules under the flat hand, and the "pucker" of the skin, alone directed my opinion. On removal, the appearances of infiltrating cancer were distinctly marked. The whole breast was full of scattered nodules of disease which appeared separate, but all of them were really connected by knotty strings and irregular branching masses of carcinomatous growth. The pectoral muscles even were infiltrated and had to be freely removed, making the operation a very extensive one.

It may be mentioned, that it seems likely this patient had suffered from the cancer during lactation, and this bad and acute case may be studied with the subject of cancer occurring during pregnancy, which will presently be touched upon, and in which the infiltrating variety of carcinoma is commonly seen.

Encapsuled Carcinoma. — It sometimes happens when cancer is of rapid growth, especially in young and vascular women, that it takes on that soft and brain-like consistence to which the terms "encephaloid," "medullary," were formerly applied. All the contracting adherent characteristics of scirrhus are then absent, and merely those of a rapidly growing malignant neoplasm present. Such tumours cannot certainly be distinguished with the naked eye from some of the more malignant varieties of sarcoma. They are soft and vascular, exuding a creamy juice on section. Portions of them are seen on section to be "broken down" with areas of blood-extravasation or degenerated cellular débris of a yellowish or ochre colour. The centre is often completely diffluent, practically forming a degeneration cyst. The growth in its early stage is encapsuled. When it has approached the surface, the skin becomes early implicated, and almost invariably inflames. Finally, the integument gives way by sloughing or ulceration, and a foul fungus, bleeding and discharging excessively, protrudes through the infiltrated and adherent opening. I have carefully observed four of these cases, and the diagnosis in the early stages involved no little difficulty.

In each of them the symptoms of abscess were exactly simulated, since they were all inflamed, the skin being red and hot with distinct fluctuation. Two of the cases were in young women, who had been suckling, and one had lately received a blow. In one of the cases, I must confess, that I confidently expressed the opinion that abscess had formed.

This most deceptive variety of carcinoma may be distinguished by the following signs:—

Should the growth be not inflamed, a soft elastic tumour will form in the breast and rapidly increase. The skin over it will soon become dusky and livid, and marked by enlarged veins. The skin becomes adherent, and finally the soft rounded bosses of disease are plainly visible. Exploratory incision reveals a malignant neoplasm.

The surgeon will be saved from confounding these tumours with abscess when they inflame, by observing that there is a suspicious amount of solid material about the base of the supposed abscess, and that the skin though red and inflamed is also thickened and infiltrated like rind of bacon, and presents the coarse puckering of "peau d'orange." Should such growths have existed, say for six months, visceral growths are especially likely to occur.[1]

The interesting case operated upon by Mr. Dent, related in the chapter on mammary abscess, shows as clearly as possible how close is the similarity between breaking down inflamed cancer and abscess.

Inflamed Cancer, "Brawny Cancer," Cancer occurring during Pregnancy.—Any variety of cancer of the breast may inflame. This is the more likely to occur in the rapidly growing varieties in young plethoric women, especially during pregnancy or lactation, or when injured by blows, excessive handling, or exploratory punctures, by septic needles or trocars. In inflamed carcinoma of this nature, the symptoms are very misleading, and I have known such cases mistaken for acute mastitis. The skin has a peculiar roseate erythematous blush upon it (cancer erythema), which spreads over the skin of the mamma and thorax, gradually fading off into the surrounding tissues. There is local heat and tenderness, and the bodily temperature is raised. A close inspection of the skin usually declares the true nature of the case, for it is infiltrated with cancer over the breast, and has invariably the "bacon rind" or "peau d'orange" appearance. The lymphatics of the integument may be markedly implicated, so that they stand out as white cords and nodules of a yellowish or white and pearl-like aspect. This extraordinary appearance with the erythematous blush is well shown in Plate XV., drawn from the breast of a woman aged thirty-five, who had an inflamed cancer while suckling, with increase of local heat and a bodily temperature of 101°. The nipple may, or may not,

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[1] Cases are referred to in the chapter on mammary abscess. The diagnostic difficulty is of double import.

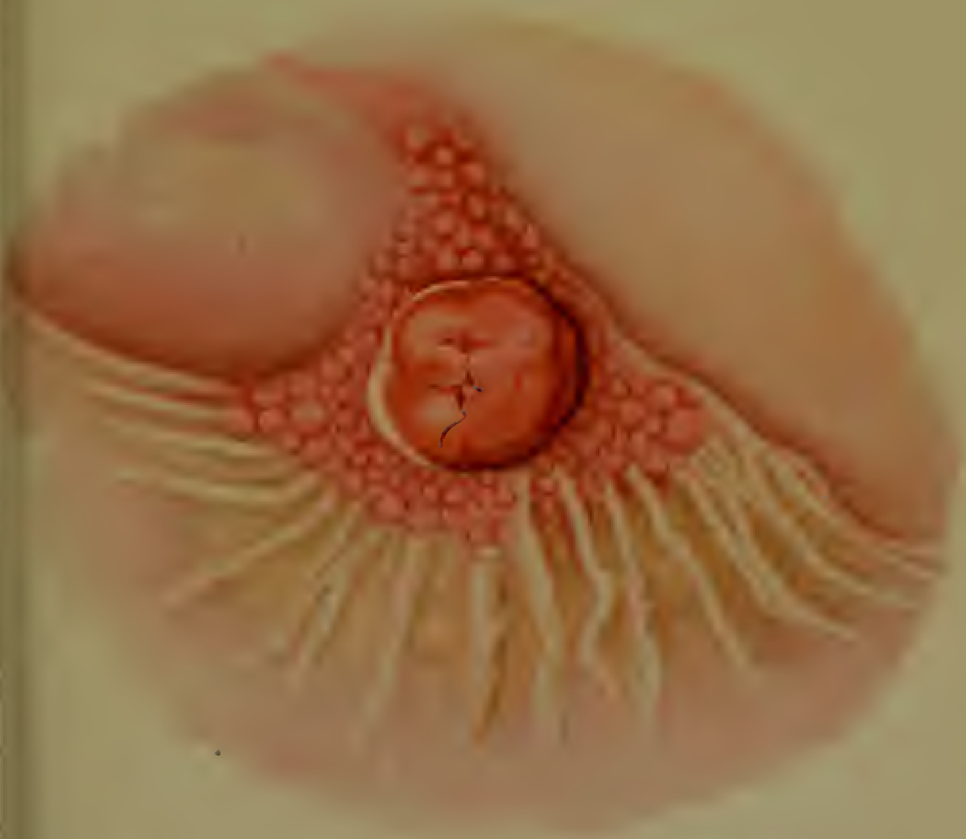

PLATE XV.

Inflamed "brawny" cancer, with great and rapid infiltration of the lymphatics of the integument round the areola and nipple.

be retracted, and on careful palpation a firm and infiltrating growth can generally be made out. The breast is always heavy.

A woman, aged fifty-two, married, was admitted into St. George's Hospital on 12th June 1896. In November last the patient struck the right breast. Since then she has noticed a swelling, which has steadily increased in size. She has lately had much sharp pain, and has lost flesh and strength. The woman has never been able to nurse with this breast in consequence of a depressed nipple. The right breast was greatly enlarged, the nipple deeply retracted, and the skin marked by the old scars of numerous sinuses, for she had suffered from frequent abscess of the gland. The skin generally was of a deep congested blue colour, but over the axillary part of the swelling it was red, and gave the appearance of inflammation. There was considerable local heat. The axillary glands were not enlarged. The inner part of the right breast contained a hard mass. It was quite uncertain as to whether this fluctuated or not. Mr. Pick made an exploratory incision, which revealed undoubted cancer. This was "hæmorrhagic," being infiltrated with blood, and breaking down superficially. The whole breast was therefore removed.

An affection presenting these characters in pregnancy or lactation, is exceedingly likely to be diagnosed and treated as inflammatory, and here I would take the opportunity of dwelling upon the characters of carcinoma in pregnancy a little in detail.

. The rapidity with which cancer spreads in the breast of a pregnant woman, and the ravages committed by its sloughing and disintegration, are well illustrated by a case related by Gay, when a cancerous breast in a young woman of thirty-seven increased to an enormous size during pregnancy, and in about ten months underwent such sloughing and destruction as to open the pleural cavity in six days!

This is very similar to Billroth's case,[1] where the disease developed in both breasts five weeks before a confinement, and death occurred in six weeks after observing the disease! The mammæ bore soft vascular tumours of an enormous size, and secondary deposits were universally found.

In Wilson's case,[2] the patient, a lady, aged forty-five, declined operation, and became pregnant for the second time. She died about a month before her confinement, the progress of the disease being fearfully rapid, probably not much more than nine months.

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[1] *Chir. Klinik*, 1871-76, p. 258.

[2] *Brit. Med. Journ.* 1878, vol. ii. p. 474.

At consultations at St. Bartholomew's Hospital, a case of the same nature was shown by the late Sir William Savory. He believed that pregnancy materially hastened the growth of these tumours. All the surgeons were in favour of removing the breast, although the woman was lactating. The child had been already weaned.[1]

Horne's case of carcinoma in a parturient woman of thirty-six was peculiarly rapid.[2] Very similar to Wilson's case is another related by Gordon,[3] but the disease was not so severe and rapid, and removal was effected with temporary cicatrisation. Treves has related a case where cancer of both breasts occurred during pregnancy, with the development of very numerous nodules in the skin round. It is not clear that the pregnancy greatly influenced this curious condition.[4] I may mention in passing that this form of acute, brawny, inflammatory cancer is seldom if ever improved by operative treatment, recurrence taking place with virulence and rapidity. Nunn relates such a case in his work on tumours of the breast. The patient was actually treated for acute mammary inflammation, and an exploratory incision made, with the idea of finding pus.

Bryant[5] strongly supports the serious prognosis, and cites 12 cases resembling, in their essential characteristics, those here quoted, when death took place with dreadful rapidity in the acute inflamed cancer.

A very striking case is related by Mr. Morrant Baker in vol. xxiii. of the *St. Bartholomew's Hospital Reports.* The patient was a lady, aged thirty-four, who had been confined four months before, and who was still nursing her infant. The right breast became large, hot, tense, elastic, and painful, and the skin over it was ruddy and œdematous, as if occupied by inflammatory exudation. The surgeon who was attending the patient believed that an abscess was in course of formation, and ordered that the breast should be poulticed; and it was not till six months later (at about the time at which Mr. Baker first saw her) that the real nature of the case was declared by the appearance of numerous cancerous nodules in the skin, and the rapid enlargement of the axillary glands. The mistake here arose because all the circumstances of the case suggested the probability that the breast was the seat of abscess, and secondly because, owing to the comparative youth of the patient, and the vascularity of the breast depending on lactation, the malignant growth was very active and attended with great vascular disturbance, leading to redness and œdema of the skin, and to tenderness and local heat. When Mr. Baker first saw the case, setting aside the presence of cancerous tumours in the skin, and the enlargement of the glands, its likeness to a deep-seated abscess was complete. "When cancer," writes Gross,[1] "takes a rapid growth, and is attended by an extensive small-celled infiltration of its framework, it is prone to inflame, as is indicated clinically by increase of suffering, elevated temperature, and discoloration of the skin. Under these circumstances, and particularly when the tumour develops during pregnancy or lactation, an abscess may form at the expense of the infiltrated connective tissue. Even when the mamma is not functionally active, suppuration may ensue, as in the case of a married sterile woman, aged thirty-nine, whose breast I extirpated last July. The tumour, which had acquired the volume of an egg in less than two months, contained an abscess as large as a filbert, filled with greenish pus."

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[1] *Brit. Med. Journ.* 1878, vol. ii. p. 358.

[2] *Ibid.* p. 662.

[3] *Ibid.* p. 560.

[4] *Lancet*, 1887, vol. ii.

[5] *Diseases of Breast*, p. 188.

On 25th October 1893 I treated at St George's Hospital a stout, florid, healthy-looking woman, aged fifty, the mother of several children, who had been a patient of Dr. Webb of Fulham Road. Her right breast had always been troublesome, the nipple was never in a condition to suckle and had given her much annoyance. She stated that two of her sisters had suffered from "stony tumours" in the breast. She has noticed the right breast enlarging for about nine months, and lately has been rubbing it with iodine liniments and ointments, since when it has enlarged rapidly and become more acutely painful. An examination of the right breast showed it to be generally enlarged, the skin was dusky and red, with increase of local heat. The nipple was retracted, and the skin adherent to an ill-defined tender mass beneath it. On the inferior aspect of the breast was another mass, apparently connected with the former by ill-defined tracts of indurated tissue. The glands in the axilla could not be felt enlarged. On the opposite breast is an old scar, marking the orifice of a mammary abscess which discharged many years ago. Seeing the doubtful nature of this case, soothing applications were applied, and the breast slung up with cotton wool padding. Liq. potassæ and iodide of potassium were administered internally. November 30th.—"There is great redness, heat, and œdema of the right breast, the induration in the left is more obvious." A consultation was held upon the case, and it was decided that an exploratory incision should be made into the right breast. This was done, and though I expected to find pus I was disappointed. Then it was obvious that there was general cancerous disease, and that the skin was extensively infiltrated. A very complete operation was performed, the integument being freely removed, and the axillary glands cleared away, but within a month of the operation tubercles of cancer began to show themselves all around the wound, while the skin became reddened and thickened over the side of the thorax, with a peculiar roseate blush, like that of erythema. The woman left the hospital, and the exact nature of the tumour in the left breast was never ascertained. The similarity to mastitis and deeply-seated abscess was in this case exact. On inquiry I hear from Dr. Webb that she died within two years of the operation with most extensive cancer.

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[1] *Tumours of the Mammary Gland*, p. 142.

The practical diagnostic points to ponder about concerning acute mammary cancer and cancer during pregnancy or lactation are as follows:—

(1) The acute inflamed or brawny cancer and pregnancy or lactation are often combined.

(2) The inflammatory symptoms are apt to conceal those of the cancer.

(3) Cancer of both breasts may be found in pregnancy and also in acute cancer, and in such cases the whole of both mammary glands should receive the most careful examination. In such cases visceral growths should be suspected.

Cancer of both Breasts.—In the St. George's cases cancer of both breasts occurred in about two per cent, a far smaller proportion than what has been elsewhere observed. It is especially in connection with operative treatment that this condition is of importance. From a diagnostic point of view, I may only point out that the second tumour may be quite unnoticed by the patient, and is peculiarly likely in its early stages to simulate a patch of inflammatory induration. There is nothing to prevent a cyst or abscess in one breast existing with a cancer of the other, and unless the surgeon adopts exploratory incisions in these very complex cases, he will be led into serious diagnostic errors. Double cancers are found when one tumour has long existed, and in any case of ordinary carcinoma allowed to remain unchecked over two years, not only is there likely to be metastatic deposit in the viscera, but a growth in the second breast is always possible, and very apt to be overlooked.

The following is a good instance of the association of cancer of both breasts with general dissemination, and shows us the importance of a thorough examination of all parts of the body in such cases:—

A married woman, spare and healthy-looking, aged forty-four, was admitted into St. George's Hospital under Mr. Haward's care on 20th

March 1896. She had noticed a "lump" in the axillary part of the left breast in the previous November, but had practically no "pain in it at all." She had suckled her three children with this mamma. For the last six months she has had pains like severe "rheumatics" in the lower part of the back, also down the right hip and thigh.

She has not lost flesh. A hard, irregular, adherent mass of obvious hard carcinoma occupies the axillary part of the left mamma. The skin is reddened, and adherent to it, and the adjacent glands are enlarged and hard. The nipple is not affected. In the right mamma, just above the nipple, is a tumour the size of a florin, which though not of stony hardness, is obviously an infiltrating growth, and almost certainly cancerous. There is stiffness and rigidity of movement in the lower dorsal vertebræ. At a consultation, when I had the opportunity of seeing this case, it was decided that early carcinoma of the spine was present, and operation was therefore negatived.

The following is an instançe of what has been stated, that if a woman bears a cancer long in one breast the other may become affected.

A married woman, aged forty-five, was admitted into St. George's Hospital in July 1889. She has had a tumour of the right breast for three years, which has been steadily increasing in size. Six months ago a similar tumour formed in the left breast. The tumours on both sides showed all the usual clinical characters of scirrhus. As the breasts were large and vascular, unilateral amputation was advised, with a period of time to intervene before amputating the other breast.

Cancer associated with other Tumours of the Mamma.—A breast carcinoma may be associated with cysts, adenomatous growths, abscesses, or, in rare cases, sarcomata. I have known lipomata to form near a mamma affected with cancer. Either the same mamma may be affected with these multiple diseases, or the cancer may occur in one mamma, the cyst, adenoma, or sarcoma, in the other. Careful attention to the features of the different swellings with exploratory incision, will usually guide the surgeon right. The association of cancer with cysts in the same or opposite breast, seems not so very uncommon. Only three cases associated with fibro-adenoma seem to have occurred at St. George's in thirty-five years.

Many cases of multiple mammary disease might be quoted; the following will suffice.

Scirrhus of one Breast, Adenoma of another.—A woman, aged forty-five, was in St. George's Hospital on 23rd March 1892. A few months before she had been an inmate, and the whole of the right breast had been removed for scirrhus. Now, in the left breast, at its outer margin, there was a small movable nodule in the breast tissue. The nipple and skin were not affected. In the scar on the right side was a small hardened nodule, which was reported to be getting smaller. It was decided to leave it alone. The nodule from the left breast was excised on the 24th, and the Registrar's notes term it an adenoma.

A case of sarcomatous tumour of one breast with scirrhus of the opposite mamma is recorded by De Morgan.[1]

A healthy-looking married woman was admitted into the Middlesex Hospital on the 4th January 1862. She had seven children, and her family history was unimportant. Five years before admission she noticed a small swelling in the left breast. A year after, another tumour appeared at a higher level in the same breast. This has gone on steadily increasing, and of late its growth has been rapid. Five weeks prior to admission, the skin gave way at the outer part, and a vascular growth sprouted forth, projecting from the skin, which can be separated from it all round. Elsewhere the skin is smooth and movable. The tumour is nodulated, slightly elastic, with clearly defined borders and very movable. The nipple is not retracted, the axillary glands are not enlarged. On the right side, the whole of the breast is occupied by a hard scirrhous mass, which has existed for a year and a half. The nipple is retracted, the skin adherent, the axilla contains a cluster of hard glands.

Believing that the left tumour was not cancerous, and as the discharge and pain were very exhausting, Mr. De Morgan removed the tumour. It presented a smooth white fibroid-looking surface, with abundance of small cysts containing a yellow viscid fluid. In some of the cysts were small endogenous growths. A section presented many cells arranged in a linear manner, so as to give an appearance of fibroid growth, "but with so little cohesion that they floated off." The mammary gland was wasted and flattened out towards the lower part of the tumour. The patient died of the scirrhus of the opposite breast between two and three years after removal of the above tumour. The left tumour never recurred.

Reading this case by the light of modern pathology, one can hardly doubt that the tumour in the left breast was an example of adenoma or sarcoma containing cysts. Its slow growth, five years, is rather in favour of adenoma; but the age of the patient would favour the sarcomatous view. The Morbid Growths Committee declared the tumour to be a round-celled sarcoma.

The Villous Variety of Duct Cancer.—In the diagnosis of this affection, I cannot do better than quote the gist of the conclusions arrived at by Mr. Bowlby, from an examination of twenty-one cases.

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[1] *Path. Soc. Trans.* vol. xix.

(1) Discharge from the nipple is common, but the tumours are not associated with "Paget's disease" of the nipple.

(2) The patients are mostly over middle age.

(3) The tumours are slow in growth, the axillary glands are not affected, the nipple and skin are not implicated, but the tumour is situated near the nipple.

(4) The tumours are firm and elastic, not knotty and hard like "scirrhus"; on section the growths are seen to be encysted, and are darkly blood-stained, soft, and friable. Some of the cysts are filled with solid growth, others with blood and serum. It can often be seen with the naked eye that the cysts originate in dilated ducts, and portions of intracystic growth can be seen springing from the walls. The growth may protrude through one of the dilated ducts at the nipple. They recur locally, but are not so prone to affect the glands or disseminate as spheroidal-celled carcinoma. Mr. Bowlby mentions the difficulty in distinguishing these cases clinically from cystic sarcoma, a difficulty in which I must confess I still share. He gives certain diagnostic distinctions, which, however, I fear, could hardly be depended upon at the bed-side.[1] For details of these twenty-one cases, which well illustrate the symptoms of the disease, this excellent paper will well repay perusal. I have no doubt in former years, that numbers of these cases were admitted to hospitals, and their true nature hardly appreciated.

To this summary I would add, that one of the leading symptoms of duct cancer and duct papilloma, is a bloody discharge from the nipple, and if this symptom exists in a woman of forty years of age or upwards, and is associated with a firm tumour near the base of the nipple, which is not retracted, the diagnosis can be made with tolerable certainty.

It is also right to point out, that more extended researches go to show that columnar-celled carcinomata are really "duct cancers" in origin, and these being hard and contracted, are not to be distinguished clinically from ordinary hard carcinoma of the spheroidal type. This does not negative or weaken the value of the classical paper of Mr. Bowlby, especially for diagnostic purposes, as regards the villous variety of duct cancer.

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[1] *Lancet*, 10th June 1893.

Carcinomatous Cysts.—Small hæmorrhagic cysts are common in hard carcinomata, and are probably due to duct obstruction. Birkett[1] draws attention to this. The cysts, according to this authority, are generally sero-sanguineous, and lined with a smooth membrane. He attributes their formation to obstruction of the larger ducts by the contraction of the fibrous carcinoma. On page 321 examples of large blood cysts in cancers are quoted. So in the villous variety of "duct cancer" cysts are generally a prominent part of the malady. Again, in the softer and more vascular carcinomata, large cavities filled with serum or altered blood are common enough. These are degeneration cysts. In all such cases as these the cysts are merely accidental associations, as it were, of pre-existing tumour growths, being usually due to hæmorrhage or inward change.

But in the class of cases we are now about to describe, cancer appears to infiltrate the walls of a pre-existing cyst. The symptoms of cyst are prominent, and those of the carcinoma exceedingly apt to be overlooked. These cases are rare, but their diagnosis is especially difficult, and for that reason I have thought it well to introduce the subject in this part of the work. An instructive discussion on this subject took place at the Pathological Society of London on 4th February 1896.

Symonds recounted three cases. In the first, a patient, aged twenty-eight, showed a small flat mass, in which a cyst ultimately developed. This, on being tapped, gave some clear fluid, and surrounding induration was afterwards felt. The cyst recurred, and, on being incised a month later, the presence of a solid growth was discovered. On removal it proved to be a carcinoma. Recurrence took place in a year, and in another year the patient died of extensive growths in the brain, without any localising symptoms. The second case was that of a patient, aged fifty-six, who was seen on 20th December 1894, with an ordinary large cyst, from which an ounce of clear amber-coloured fluid was removed. It was tapped again a month later, and on 13th February, having again refilled, was removed with some of the surrounding tissue. By 23rd July 1895 the swelling was as large as ever. It was again tapped, similar fluid being removed. On October of the same year it was larger than before. The old scar was thin, and through it the dark appearance of the cyst could be seen. On incising, the wall was found to be hard and studded with nodules and projections of dense growth. The whole breast was removed. The specimen showed an oval cyst the size of a large egg, with a septum partially dividing it into two. The microscopical sections exhibited, displayed the ordinary appearances of carcinoma. The third case was a patient, aged fifty-five, who had noticed a tumour for a few days only. It was hard, nodular, flat-topped, and without fluctuation. A preliminary incision went through an inch of dense tissue. After removal an ordinary serous cyst was seen projecting from the under surface of the gland. It had a smooth wall, except at one point where a small nodule existed; this, on being examined, proved to be carcinoma. In his remarks Symonds called attention to the fact, that in all the cases the cyst was near the periphery of the gland, and therefore differed from the ordinary duct cancers. In none was there a second cyst. The secondary deposits in the brain of the first case had the appearance of abscesses, on account of the central degeneration. In the second case the cyst, when first removed, showed a small nodule which had not been examined microscopically, but in the light of the subsequent recurrence and of the appearances found in the third case, was no doubt carcinomatous. He considered that, important as these cases were, they did not justify us in recommending immediate operation in all cases of solitary cysts. Targett referred to a case in Guy's Hospital of a recurrent carcinoma in a woman of forty-five. This took the form of a cyst, the walls of which were carcinomatous. At the same meeting Morton gave the history of two patients, about fifty years of age, from whom large cysts had been removed, the walls of which were carcinomatous. In the first a swelling had been noticed for eight months; this was incised and drained, but within a month a solid formation had grown around the cyst, and after removal this was found to be carcinomatous, the carcinoma being of the common mammary type. In the second instance the swelling seemed fluid throughout, save that it presented a small nodule at one part. Incision of the cyst was practised, the nodule was cut into and found to be a typical carcinoma, the diagnosis being confirmed afterwards microscopically. Butlin related how he had many years ago examined what was thought at the time of operation a simple mammary cyst, and discovered one spot where there was a carcinomatous thickening; in a few months recurrence took place, the breast was removed, and found to be the seat of a carcinoma, in which lay two large cysts.

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[1] *Path. Soc. Trans.* vol. ix.

The following cases are excellent illustrations of this rare and curious malady.

A stout married woman, aged fifty, was admitted into St. George's Hospital on 28th April 1896. Twelve months before admission she had

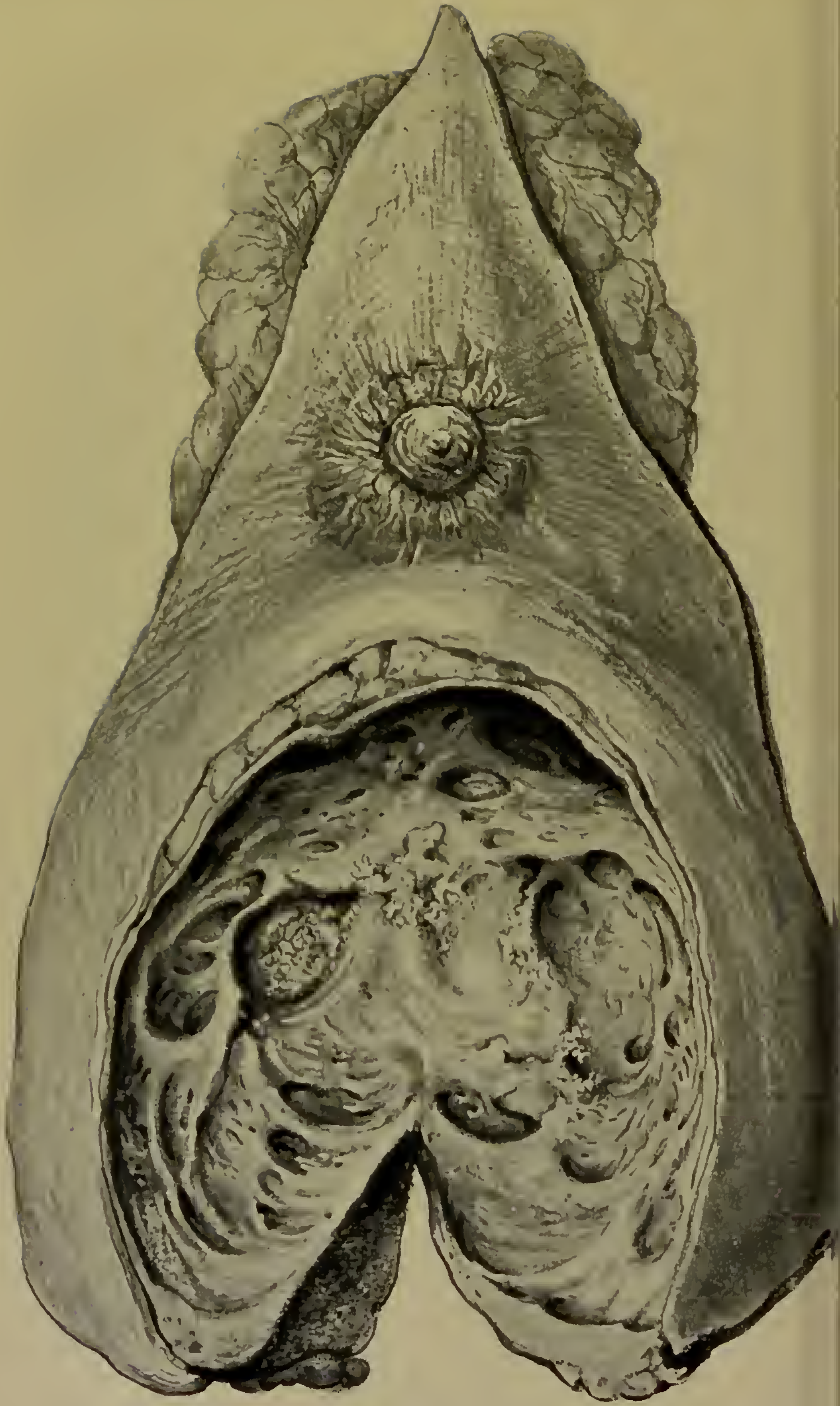

FIG. 51.—A carcinomatous cyst of the mamma, to show the reticulated interior like a cardiac ventricle. The walls are thickened by cancer. From a specimen in the Museum of St. George's Hospital.

a blow upon the right breast, and four months after the injury she noticed a swelling arise. The skin has been red and "inflamed" for quite three months, and there has been an occasional clear discharge from the nipple. There is a good deal of pain and throbbing in the affected breast. The inner aspect of the mamma is occupied by a circumscribed swelling the size of a small melon, which seems to "point" at its summit. Here it fluctuates distinctly, elsewhere it feels elastic, and has obviously thickened walls. The skin over it is a deep, livid red, and the colour stops abruptly at the circumference of the swelling. The nipple is not retracted, and the axillary glands are free. The breast was removed on 7th May. The tumour proved to be an unilocular cyst. Its cavity was the size of a large orange, filled with "ropy," sanguineous, albuminous fluid. The walls were thickened and of gelatinous consistence, cutting exactly like a section of succulent melon. The interior of this remarkable cyst was curiously reticulated, similar to the interior of a bursa, or a cardiac ventricle. There were no papillomatous growths. Under the microscope distinct deposits of carcinoma were found infiltrating the walls of the cyst. Dr. Rolleston was of opinion that this was an example of a spheroidal-celled carcinoma developed in juxtaposition with a simple cyst of the mamma; it was not a cyst found in carcinoma, or carcinomatous degeneration of the cyst wall, but invasion of the cyst wall by the growth.

A healthy-looking married woman, aged thirty-six, the mother of ten children, was operated upon for a tumour of the right breast on 22nd February 1896. The tumour had been noted for twelve months, and for three months it had grown very rapidly. The nipple and skin were not implicated, and the growth occupied the upper part of the breast, the bulk of the mamma being free of it. The tumour was the size of a large shattock, and projected forwards from the thorax in a remarkable manner. It was "bossy" and lobulated, and fluctuated distinctly. The skin was livid but not adherent. The whole breast and tumour with the skin round were freely removed, and the pectoral fascia dissected away. The axilla was not opened. On examining the fresh specimen, it was seen that the tumour was in no way encapsuled, but infiltrated the upper aspect of the mamma very markedly. The growth was soft, almost gelatinous, and contained a cyst the size of a small orange filled with blood and mucoid material. There was no distinct lining membrane to the wall of this cavity, which seemed to be formed of soft growth; at one or two places there were soft papillary projections.

Microscopically, the tumour was a soft carcinoma. The presence of cysts had led to the diagnosis of cystic sarcoma during life. The case was an example of cysts forming in carcinoma by mucoid degeneration.

An instance of a similar nature occurred at St. George's in February 1821. A woman, aged fifty-five, had a prominent projecting tumour of the right breast, looking as though the gland had been suddenly distended with fluid. It had been growing for nine months. On its removal by Pollock, the tumour was found to consist of a very large cyst filled with dirty opaque fluid occupying the centre of a mass of medullary cancer, the parietes of which were in some places exceedingly thin.

Sir T. Smith[1] relates a remarkable case of a large cystic tumour of the breast associated with scirrhus, which had undergone calcareous change.

The tumour was removed from an unmarried woman, aged sixty-five, of marked cancerous inheritance and family history. Seven years before, she had consulted Paget, who diagnosed "cancer," but advised against operation. For the last three years there has been rapid enlargement, caused by a cystic tumour the size of a foetal head; towards the upper part of it was a hard lump, said to be the original carcinoma. The axillary glands were free. The tumour was removed on 18th March 1871. It consisted of a large unilocular cyst containing a brownish fluid, and having the gland structure spread over it. In the upper part of the cyst wall was a "scirrhous cancer" measuring about two inches in its transverse diameter. The carcinoma was of ordinary character, but in the centre it had undergone the rare change of calcification. This case has been before referred to in connection with the latter phenomena.

The pathological explanation of these cysts may be given on different grounds. Possibly they originate in several ways. Their interior is so defined, that they can hardly always form through degeneration within a growth. The fact that nodules of cancer have been seen at definite parts of their walls, points to the fact that either cancer invades them from without, or starts at some definite point within their parietes. All such considerations are largely speculative, and do not concern us here. The diagnosis of carcinomatous cysts, which it cannot be too often impressed upon the reader are exceedingly rare, rests upon the following points:—

(1) The patients in recorded cases have been generally adults of from forty to fifty years of age.

(2) The cysts have been large, oval, or round, and the contents clear amber-coloured, or glairy and colloidal fluid.

(3) On exploratory incision either nodules of solid growth have been discovered at one part, or the walls of the cyst have been thickened and definitely infiltrated.

In the chapter on the treatment of cysts of the breast, it is laid down as a rule that cysts associated with definite solid growth in, not upon, the walls should be treated by amputation of the whole breast and removal of the adjacent lymphatic tracts. This rule well applies in the difficult and puzzling cases I have just mentioned. The diagnosis of carcinomatous cysts can hardly be made without exploratory incision, and this should be insisted upon if a large cyst form slowly in the breast of a woman of advancing life. The operator will do well not to be too positive in his opinion, until he has inspected such formations by exploratory section.

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[1] *Path. Soc. Trans.* vol. xxii.

The surgeon must be on his guard regarding carcinoma occurring in an "axillary mamma."[1]

Carcinoma occurring primarily in Accessory Mammæ, or in outlying portions of the Mammary Gland.—A married woman, aged fifty-four, was admitted into St. George's Hospital in the year 1877, under the care of Mr. Holmes. Four months previous to admission a lump had appeared in the left arm-pit and gradually increased. It was opened with a lancet, but nothing appeared save blood. Soon after the pain became intolerable, and small lumps "like warts" appeared in the skin round. She became thin and weak, and the lumps in the skin became more numerous.[2]

The history of such cases makes it clear, that the cancer really originates in one of the accessory glands containing mammary structure, so often described in the skin of the axilla.

In the majority of cases of carcinoma occurring at the fold between the dependent mamma and the thorax, the disease will really be scirrhus, though it looks like epithelioma. The growth develops in a piece of outlying mammary substance. At first a nodule no larger than a pea or small bean, it ulcerates, and a small sore the diameter of a sixpence with hard indurated edges and covered with a scab, remains. The hardness and induration are typical of the nature of the malady, and though the case looks insignificant, it is not really so. No pectoral muscle intervenes, and consequently the cancer infiltrates the intercostals and walls of the chest in a very serious manner. So superficial does this form of carcinoma appear that, believing it originates in the skin, it is often erroneously diagnosed as epithelioma.[3]

The following conditions may also give rise to diagnostic difficulties:—

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[1] I have stated my belief that this condition is rare. Paul's case quoted on p. 292 may be read with above.

[2] See pp. 291, 292.

[3] See Plate XI. p. 293.

Phantom Tumours.—Patients are apt to imagine that almost every disease of the breast is cancerous, and accordingly we find that the fears and horrors of cancer haunt those who suffer from the knots and lumps of mastitis or abscess, or such harmless growths as the simple adenomata. These can hardly be called imaginary, but now and then in practice we meet with cases of real imaginary disease, "phantom tumours" about the breast. Some of them are really due to slight mastitis with excessive nerve pains, some to natural prominences, as a costal cartilage, and others to a curious contraction of the pectoral muscle. Regarding all such cases the neuralgic symptoms, the tenderness, hyperæsthesia, and bitter complaints of pain by the patients, are far in excess of what would really obtain in early cancer. Moreover, often enough a suggestion of cancer has in some powerful way been pressed upon the mind of the individual. She has had a tumour removed from some other part, or a relation or friend has died of breast cancer, and she has thought or read much about the disease. It is here needful to carefully estimate the mental condition, and as regards the rule of diagnosing imaginary affections from carcinoma, we have only to observe that no true tumour exists. It may be needful to examine such a case under anæsthetics, and then a curious contraction of the pectoral muscle which some of these persons exhibit, will quite fade away and disappear under the examining touch. In my own experience I must have seen at least half a dozen patients who were convinced that a prominent costal cartilage was a tumour, and, so far as I recollect, in nearly all of them there were temporary and severe neuralgic pains, and the patients had lost relatives from cancer of the breast.

There is also an indefinite condition of the breast found in young unmarried women to which the term "hysterical breast" is often applied. The breast is enlarged with great hyperæsthesia of the skin. The symptoms are aggravated at the menstrual periods with increased pain and swelling. Often enough indistinct tumour-like masses are to be felt, which give rise to great alarm. Personally I believe these are due to some obstruction of serous secretion, and consequent induration, but they have been attributed to an œdema of the connective tissue of the gland similar to those transient œdematous conditions of the integument, which have been observed in neurotic affections.

A single woman, a nurse, aged forty-two, came to my out-patients' room at the Waterloo Bridge Hospital on 3rd June 1894. She had suffered, according to her own account, from pain and uneasiness about the left breast for two or three years, getting worse and worse. She had noticed a painful lump at the upper part of the breast. On examination the breast was flaccid and shrivelled, but the nipple was normal, and there was no dimpling of the skin. Careful examination failed to detect any definite tumour. The parts were, however, very sensitive, and the patient pointed to the "tumour," as she termed it. This was a prominent left third costal cartilage, such as is not uncommon in women who have bony and prominent thoracic development. It was very tender, she could hardly bear it touched, and the pains on pressure radiated widely over the chest and down the arm. She volunteered the information that during her professional duties she had nursed a patient with a cancer of the breast, and had afterwards "seen it in a bottle with the roots attached." Since then she had carefully examined and watched her own mammary regions with the above result. This patient was treated with bromides and iron, but she remained long unconvinced, and seemed to get more relief from free blistering over the prominence than anything else. Had she moved in more elevated circles, she would doubtless have "gone the rounds," until she found some one ignorant or unscrupulous enough to submit her to operation or "cure" by some of the many bogus remedies for carcinoma always in vogue.

A housemaid, aged twenty-seven, was admitted into St. George's Hospital on 21st February 1893. For about a year she had suffered from pains in the right breast, and for six months a swelling had been noticed at the upper and outer side of the mamma. A small tumour, described as tender and movable, was to be found at this situation. The skin was not adherent, and the nipple and glands were unaffected. On 23rd February the tumour was cut down upon by an incision about 3 inches long, along the outer border of the pectoralis major. No tumour could, however, be found. The wound soon healed, and on 2nd March the patient was discharged quite well.

A married woman, aged thirty-two, saw me at St. George's Hospital in April 1896, suffering from pain in the right breast, and the "growth of a tumour." She experienced some "shooting" pains, and was very anxious about the "formation of cancer." On examination the right, fifth, and sixth costal cartilages are unduly prominent, and the pain radiates about the arm and neck. There is no tumour to be felt in the breast, but the skin is very hyperæsthetic. The patient is markedly pale and anæmic. Twenty grains of carbonate of iron were ordered in pills, and the parts covered with a mercurial plaster. In three months the woman was far less anæmic and anxious. The pains had nearly gone. A smart blister over the prominence above referred to removed the tenderness and hyperæsthesia.

K. P., fifteen, a housemaid, was admitted into St. George's Hospital in February 1880 under the care of the late Mr. Rouse. Her health had been good with the exception of pain in the left side, and the catamenia had commenced two years before. Six months ago she noticed a swelling under the left breast, which was very painful, and prevented her moving or coughing. The lower ribs below the left mamma protruded in a curious manner, and there was an ill-defined swelling in the left hypochondrium extending from the mid line near the ribs; this was very tender when pressed upon. The breast was larger than the other, but no distinct tumour could be felt in it. After observation, the girl was treated for dyspepsia, no true tumour apparently existing. The skin was severely blistered, over patches the size of a shilling, with vesicating collodion. She got perfectly well, and the conformation of the ribs was obviously a natural deformity.

An unmarried girl, aged twenty-three, saw me at St. George's Hospital on 18th August 1897. She gave the history of being struck with a golf ball on the right mamma about three or four years ago. It was doubtful whether this had anything to do with the present trouble. About two months ago she noticed a swelling in the right breast quite by accident. The patient was a healthy-looking subject. On examination a prominent tumour could be seen in the upper part of the right mamma. On examination this was produced by the third, fourth, and fifth ribs, which were acutely flexed just anterior to the angles, so that an obtuse ridge-like prominence had been formed, pushing the mamma forward upon it. The breast itself was quite healthy. No true tumour existed.

The treatment of "phantom tumours" of the mammary region is conducted on general principles. The pain and local hyperæsthesia are commonly enough dependent upon such conditions as extreme anæmia, gastritis and dyspepsia, or disordered functions of the pelvic organs. All such matters must be carefully inquired into, and any indications for treatment carefully studied. Locally, anodyne applications may be applied, and if there be much tenderness at one spot, as over a prominent cartilage, a succession of small blisters gives marked relief. If added to all this be change of air, scene, and society, and firm assurance on the part of the surgeon that nothing serious exists, such cases will almost invariably be brought to a successful termination. The carbonate of iron is peculiarly useful in neuralgia associated with anæmia, and was extolled by the late Sir T. Watson. Galvanism may be tried. The pectoral region may be painted with equal parts of hydrate of chloral and camphor, and covered for a month with wool and a gummed bandage, while the patient is kept at the sea-side. Personally, I would never advise or perform operations for these conditions. I have known surgeons adopt this course, and argue that the "pomp and circumstance" of an operation, combined with the scar of an incision often cure these patients. I would only say that such proceedings deliberately encourage what is so much to be deprecated, a morbid interest in the patient's own sufferings, and the fussy and mischievous attention of foolish friends and relations. And if operations cure a "phantom tumour" in one place, the patient will soon imagine she has one in another, or will simulate a spoiled joint, or one of the various imaginary disorders with which experienced and shrewd practitioners are familiar. The surgeon who operates for "neuro-mimetic" conditions will be fortunate if he escapes with mere failure, and such practice often brings its own unpleasant reward of subsequent recriminatory charges and professional condemnation.

TUMOURS ORIGINATING IN THE RIBS OR PECTORALS.—As an instance of malignant tumour growing from the ribs beneath the mamma and simulating disease of the breast itself, the following case is instructive: A lady aged 30 had for four months a tumour, supposed to be of the right breast. In 1824 Brodie was consulted and satisfied himself that the tumour was entirely beneath the breast. At her death the tumour involved the ribs and pectoral muscles and projected into the chest, but was still covered by pleura. This specimen has been recently examined by Drs. Rolleston and Latham, and is probably a carcinoma (St. George's Hospital Museum, 2334).

Fibro-adenomata.—These tumours do not often simulate scirrhus. When they occur in elderly women they may be very hard, nearly calcareous, and perhaps adherent from inflammatory changes. Their leading symptom, mobility, is thus lost. In such cases the microscope alone will make the diagnosis clear, and the surgeon will do wisely to remove the whole breast, as the invasion of such growths by carcinoma is not unknown.

Chronic Mastitis.—In the chapter on this affection, the relationship of it with cancer, and the differential diagnosis between the two affections have been already touched upon. The surgeon cannot too certainly recognise that there is no reliable distinguishing sign between extremely early cancer and a patch of inflammatory induration, and the effects of the pressure treatment combined with iodides and blistering may be the only guides. In a woman of the cancerous age, increase of such a patch despite treatment, should at once lead to exploration and probably excision of the whole gland.

Great diagnostic stress will be laid upon the following points:—

(1) When in a given case of suspected chronic mastitis a definite tumour is felt under the flat fingers, such tumour will be more than mere inflammatory growth. It may be a cyst, a carcinoma, or an abscess.

(2) Chronic mastitis is seldom localised strictly, but areas of it are scattered about within the breast, and both breasts are commonly enough affected. This is in striking contrast to early scirrhous cancer when the growth is generally single and isolated; yet some of the worst cases of carcinoma, well termed infiltrating, spread about the breast almost exactly like chronic mastitis. They are exceptional, and in the cases I have seen I have never failed by palpation with "the flat of the fingers" to detect one or more definite nodules, which at once made me suspect the true nature of the case.

(3) Retraction of the nipple is common enough in chronic mastitis. The axillary glands are, in my experience, generally a little enlarged and tender. A definite dimple or pucker in the skin is not found, unless cancer exists, or there has been an abscess or an old cyst which has shrivelled.

The following extract from a Clinical Lecture by myself on this subject, in the *British Medical Journal* for 6th June 1896, may here be quoted.

> "In the second class of cases, the most perplexing of all, when, notwithstanding the exercise of all diagnostic rules, one is in doubt between chronic induration and infiltrating cancer, I always advise the following course of treatment. The breast is covered with a plaster of diluted ung. hydrarg. co., and then with several layers of cotton wool or Gamgee tissue. The old-fashioned breast bandage is then applied and reapplied daily with care and even pressure. If the parts are not very tender an elastic bandage can sometimes be borne. At the same time I give internally full doses of the iodides with mercury. Sir J. Paget and some of the older surgeons used to give drachm doses of the liquor potassæ in these

cases, and I have certainly known the remedy beneficial. Now you will find to your surprise and the satisfaction of your patients, that a certain number of these cases will definitely improve under this plan of treatment, that the "lumps and knots" will get softer and less and less, and finally the mamma will assume much its normal condition. The course of events may be, however, very different. The pressure and the remedies do little towards alteration of the conditions observed, which, if anything, increase in spite of them. As a fair average of time, I would give a full three weeks' trial to these tentative remedies. If at the end of that time matters are as bad as ever, what is next to be done? Now these conditions of the breasts are sometimes found in women under the age of twenty-five, and removal is to them a most serious consideration. In such, unless there is a definite increase, you may wait and watch. The remedies may be continued and the general health carefully attended to. In older persons, when the mammæ are functionless, and the time of life is that when cancerous change is prone, I have no doubt that removal is the best policy to adopt, and to urge very strongly. You will be right in saying that the disease is one which will not improve by less severe measures, but I do not know that you are justified in saying that it will "end in cancer." When such breasts are removed you will appreciate to the full the extraordinary difficulty of discriminating. You will find that even distinguished and accurate pathologists are often in doubt whether the cellular proliferations present are inflammatory or really early carcinoma. Sections being made in all parts of the indurated tissue will, commonly enough, justify the expression 'probable early carcinoma.'"

If cancer be not found, but only tough, fibrous tissue, and cysts, the surgeon has merely removed a diseased and functionless organ in a degenerated condition, which, in the opinion of many, usually ends in carcinoma.

The above rules I believe to be sound and right, and I have acted upon them with manifest advantage and to my own satisfaction. A small disc of cancer may easily be associated with cysts and chronic mastitis. The following case by Hutchinson well illustrates this most important point,[1] and shows the difficulties which surround these cases. It also points to the importance of marking a small induration with indelible pencil, before operation.

"The difficulties in the recognition of cancer of the breast in its earliest stages are well illustrated in the following case. I had attended Miss S.'s mother twenty years ago on her death-bed for an abdominal tumour, and it was known that one of her aunts had died from cancer of the breast.

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[1] *Clin. Journ.* 19th December 1894.

Miss S. herself, aged forty-six, and in good general health, came to me in September last, in great anxiety about her own breasts. She was rather stout, and the breasts were full. In both breasts there were ill-defined indurations. After careful examination, I satisfied myself that in the left, deeply placed, there was a disc of ill-circumscribed thickening, which was probably cancer. Having regard to the patient's family history, I advised a precautionary operation, and to this she readily assented. On the operation table, two or three weeks after my examination of the case, I had forgotten in which breast it was, and the conditions in the right seemed more suspicious than those in the left. The nurse, however, assured me that it was the left breast that the patient expected to have removed, and, on more careful examination, I again recognised the induration which I had formerly discovered. One of my assistants expressed the confident opinion that there was no cancerous growth in either breast. The size of the breast was such that I felt sure I should gain no conclusive information from an incision into it, and, feeling tolerably certain in my diagnosis, I proceeded with the operation. It should be said that there was not the slightest retraction of the nipple. On incising the breast after its removal I found a great number of small cysts containing greenish fluid, and varying in size from a horse bean to a small cherry. The lobules of the breast were dense, and in some parts almost hard, but their section was white and fibrous, and showed no trace of cancer. For a few moments I thought I had made an error, and that there really was no malignant growth; but, having turned the breast over and carefully identified the part which, before the operation I had thought most suspicious, I there found a disc of induration, about the size of a half-crown and twice its thickness, a section of which presented, as all admitted, the most characteristic conditions of scirrhus. We have, therefore, a good instance of cancer occurring in association with other non-malignant changes in the gland, the presence of which made its recognition very difficult. As regards the other breast, I have no doubt that there are in it many small cysts, and that, with the exception possibly of the absence of actual scirrhus, it is in the same condition as the one excised. It is now four months since the operation was performed, and Miss S. is in such a condition of continual anxiety about the remaining breast that it will, I think, be the wisest and kindest measure to remove it also. It is, of course, quite impossible, after our experience of the other, to assure her that there is no risk of cancer, or to give any other reply than an affirmative one to her question, "Would it not be safest to remove it?'"

Diagnosis of Carcinoma from Cysts and Abscess.—It is in these cases that the most disastrous errors are made in matters of diagnosis of mammary disease. The remarks here made are merely supplementary to the chapters on those affections, which should be read especially from the standpoint of diagnosis from cancer. The vital importance of the subject will serve as an excuse for what may seem "vain repetition."

It will be well at the outset to point out that if any surgeon thinks he is clever enough to certainly distinguish between solid tumours and some of the more peculiar abscesses or cysts found in the breast without exploratory incision, he will sooner or later make an egregious error. In acute abscess it is rare that any trouble arises. It has been pointed out that inflamed cancers or inflamed cancerous cysts may exactly simulate this condition, and sometimes acute abscess arises in the neighbourhood of carcinoma, when the latter is affected with septic ulceration and infection. There may be cracks or abrasions upon the nipple, or some mark of bygone suppuration may be evident. Throbbing pain, signs of local heat, slight redness or œdema of the integument may lead to a correct supposition. Firm pressure with the pulp of the fingers may elicit a feeling of elasticity. The cases related at the termination of the chapter on mammary abscess are all sufficient to show that, so far as chronic abscess is concerned, without exploratory incision a certain opinion is usually impossible. Indeed one case is there reported, when even after this precaution was adopted so much indurated tissue existed round the breast, that amputation was performed under the supposition that the case was an instance of suppuration within carcinoma. In a considerable number of instances of chronic abscess, suppuration had taken place in the mamma before, perhaps many years before, and this led to retraction of the nipple. The history of old abscess should therefore place the surgeon doubly on his guard.

In simple or papillomatous cysts of the breast precisely the same difficulty arises. These formations are commonly enough multiple, while separate unconnected deposits of cancer in the same breast are so rare that the mere fact of such an occurrence should raise suspicion. Yet one of the tumours may be a cyst and the other a carcinoma, and this association is common enough. Single cysts with thick walls, which are deceptively hard, are said by some authors to be very exceptional. My experience entirely negatives this statement, and I have recently (1897) treated three such cases in succession. Firm pressure upon these cysts with the pulp of the index finger almost always elicits a sensation of elasticity, and exploratory incision will complete the diagnosis and the cure.[1]

In a few of these cases, the cyst can be emptied by pressure upon the nipple, but then the swelling is not exceedingly hard. Excessive tension upon the walls of the cyst by contained fluid is needful for complete simulation of scirrhus. Ancient galactoceles with their inflammatory thickening, perhaps more closely resemble scirrhus than anything, and reliance can seldom be placed on the history.

In the chapter on Cysts of the Mamma perhaps sufficient cases have been related to serve as examples of the close similarity between carcinoma and certain cystic formations. Numerous instances are recorded in all our hospital notes, but the following are sufficiently striking to impress the clinical importance of this matter upon the reader without, it is to be hoped, wearying him with multiplicity of illustrative details.

A woman, aged sixty-seven, was admitted into St. George's Hospital, under Mr. Haward's care, in September 1890. She had noticed a swelling in the left breast for an indefinite time. It was noticed that the patient looked thin and anxious, and at the lower and outer part of the left breast was a small hard tumour connected with the skin, but quite movable on the parts beneath. The nipples were deeply retracted on both sides. The tumour was opened under anaesthetics, and a quantity of turbid fluid squeezed out. The capsule of the cyst was dissected away, and the patient did well.

A case more closely resembling carcinoma in age, appearance, and local symptoms, it would be difficult to describe.

A woman, aged forty-six, married, was admitted into St. George's Hospital in August 1883. She had noticed a tumour in the left breast for about three months. She was a stout, florid person. The skin, nipple, and axillary glands were all unimplicated. Deep in the middle of the breast was a very hard, rounded, freely movable lump the size of an orange. An exploratory incision was made into this under ether, and the supposed solid tumour proved to be a cyst, with clear contents. The opening was enlarged and the cyst-wall dissected out. The patient made a good recovery.

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[1] A series of cases of cysts simulating scirrhus was communicated by Bryant to the Medical Society of London, 1895-96. To this surgeon should especially be given credit for dwelling upon the value of exploratory incision in these cases.

In the chapter dealing with galactocele an instance is related of removal of the entire breast, for the milk-cyst was mistaken for a sarcoma.

It has been pointed out how frequently cysts and carcinoma co-exist, and the following is a striking instance of cysts occurring in the opposite breast to that affected by cancer.

A woman, aged forty-four, was admitted into a London hospital in July 1894. The right mamma had been removed for undoubted carcinoma a year previously, and the scar of the operation had remained healthy. Shortly after the first operation a "lump" was found in the other breast, which, apparently, had escaped notice at the time. This has been getting steadily larger since, and caused her great alarm. At the present time there were two hard tumours to be felt in the left mamma. The skin was not puckered, nor the nipple retracted. The left mamma was removed, but on examination one large and one small cyst was found, surrounded by dense indurated tissue. There was no trace of cancer. Here the occurrence of cancer in one breast was too strong presumptive evidence of cancer in the other, and led to removal.

Keloid and scleroderma have been alluded to in the chapter on affections of the skin and nipple. These conditions may closely resemble cancer.

I think it right to point out, in concluding this important part of the subject, that the doubts and difficulties which hospital surgeons feel regarding the diagnosis of carcinoma of the mamma, are often enough not shared by those who lack extensive experience. Accordingly positive opinions are often given upon insufficient grounds, and it is from this circumstance that quacks and charlatans reap a rich harvest, "absorbing" or "curing" tumours which members of our profession have too hastily or rashly affirmed to be cancerous. It is sincerely to be hoped that a perusal of this chapter, will show the practitioner that though the diagnosis is usually plain enough, it may be surrounded by such difficulties as to puzzle experts, and this should lead to excessive caution in expressing definite opinions, and especially in the advising of operations.

CHAPTER X

THE OPERATION OF REMOVAL OF THE MAMMA

Views of Moore and Gross—Researches of Heidenhain and Volkmann—Importance of early operation—Extensive operations for advanced cancer seldom successful—Question of survival without operation—Risks of operation—Question of "cure" of the disease—Local conditions which negative operation—Local conditions which favour operation—General conditions to be investigated before operating—Method of operating—Preliminaries—Importance of ulcerating carcinoma—Disinfection of—Posture of patient; preparation of skin, etc.—Choice of anæsthetic—Operation—Guides for selection of operation—Dressing—Operation in cases of peripheral carcinoma, and where much skin must be removed—Difficulties of clearing axilla—Accidental opening of thorax—Sketch of Halstead's operation—Question of operation in cancer of both breasts—Question of treatment of recurrent growths—Berger's operation—Operations on mamma in glycosuria—In great obesity—After dangers and complications of removal of the breast, including tetanus—Sudden death—Mania—Delirium tremens—Chemical erythema—Operations on the mamma in pregnancy—Death from entrance of air into a vein—Keloid of scar—The results of operations for cancer of the mamma.

The tendency of modern operations upon cancer of the breast is to operate early and operate completely. It is singular that our forefathers, even in the days of Antyllus, in their rough and barbarous methods of sweeping off the entire mamma and applying the cautery, preceded modern practice in the completeness of their methods, and had they operated in early cases their results might have been far more satisfactory than seems to have been the case.

In 1867 Moore of the Middlesex Hospital wrote a classical paper[1] which called attention to inadequate operations upon cancer of the breast. He pointed out the completeness of the ancient proceeding of sweeping off the entire mamma, and affirmed that by their readiness to unite flaps, surgeons had rather now advanced to the opposite extreme. After relating a series of cases which illustrate recurrence from incompleteness of the primary operation, Moore concludes that cancer of the breast requires the careful extirpation of the entire organ. That the situation where the operation is most likely to be incomplete is towards the margin of the sternum, that besides the breast unsound adjoining structures, especially skin, should be removed in the same mass with the original disease. Moreover, this surgeon in using the term "centrifugal dispersion" of cancer, clearly demonstrated the spread of disease from a central focus, maintaining the local rather than the constitutional origin of carcinoma.

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[1] *Med. Chi. Trans.* 1867.

The views of Moore did not get as much attention in this country as their importance warranted: but it is right to point out the priority of an English surgeon in calling attention to the importance of complete removal of the breast and surrounding structures in cases of cancer, as long as thirty years ago. His teachings seem to have taken root in Germany, rather than in England.

Gross writing in 1880 indicates as plainly as possible the steps of an operation now generally advised. "The proper proceeding is to remove the entire breast and its coverings by a circular incision, search for any outlying lobules that may be disseminated through the mammary region, dissect off the fascia from the pectoral muscle, and prolong the outer portion of the incision into the axilla with a view to its thorough exploration."[1] In this country, however, during the last fifty years, surgeons have not as a rule taken up the views of Gross and Moore, and more incomplete operations have been generally performed, the axillary glands having never been interfered with unless obviously enlarged. Numbers of leading surgeons also in America, never adopted the methods of Gross, and the practice inculcated by him hardly took what may be termed "a firm hold" there.

At or about the year 1889 Heidenhain[2] made an elaborate investigation upon the reverse sides of mammæ removed for cancer. He pointed out very clearly, that the proliferating epithelium readily penetrates the pectoral fascia, and infects the surface of the pectoral muscle. The cellular infection runs along the blood-vessels, and perivascular lymphatics. Heidenhain strongly intimated that by muscular movements, the lymph and cancer cells are forced along the muscle, and that hence very insidious and deep infection occurs. In many cases, and especially in thin women, lobules of mammary tissue actually pass into the pectoral fascia, and are very apt to be left behind. The fascia cannot be removed from the muscle, unless the fibres of the latter are also freely taken away. The practical outcome of these researches is the free removal of the pectoral fascia, and of the pectoral muscle itself, should this structure be invaded. As a rule it may be pointed out that any fixation of the cancer upon the pectoral, means such deep infection of the latter that the whole muscle needs removal. This is one of the most important results of Heidenhain's teaching for practical surgeons to realise. This author also showed pretty conclusively that a mamma which contains a cancer, however small, is diseased throughout, the cells everywhere showing signs of reproductive activity. In this he has been supported by more modern investigators.

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[1] *Tumours of the Mammary Gland*, p. 225.

[2] See *Annals of Surgery*, vol. x. 1889.

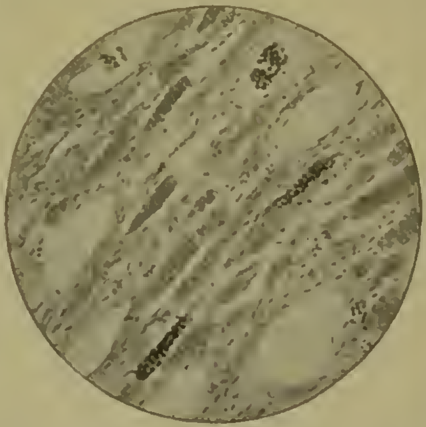

FIG. 52.—A section of pectoral muscle in a case of deeply-seated carcinoma. The groups of cancer cells are seen between the muscle fibres.

Volkmann's researches on this subject were also very accurate and important. He maintained that the current of lymph was rather from the muscle to the fascia, than from the fascia to the muscle, and that the fascia offering resistance to the passage of the cells, it was most important not to leave it, since flattened plates and masses of growth remained in its structure. The researches of Heidenhain have been amplified and verified by such workers as Stiles of Edinburgh. The latter especially pointed out the passages of infection along the lymphatic paths. I have examined a number of specimens of breast tissue at a distance from the cancer, and find the greatest variation as to the conditions present. I venture to believe, that the assertion that the whole of the mammary tissue is diseased in carcinoma is far too absolute, and should look upon the lymphatics as the true sources of dissemination of disease.

Halstead and Meyer in America, and Banks in this country, have been among the first to recognise the value of Heidenhain's researches and turn them to practical account.

In discussing the operations for carcinoma of the breast and the indications for their performance, we must therefore make due acknowledgment to the work of pathologists. It is on their studies that the importance of the "complete operation" for cancer of the breast is especially founded. The ease and safety with which the principles of asepsis make it possible to do operations of enormous magnitude, have perhaps rendered modern surgeons a little too careless of what they undertake. There is now a tendency to operate upon all cases of cancer of the breast, and the more extensive the disease the larger the operation. I feel here that the greatest care and judgment is needful in estimating the advisability of the performance of these operations. The interest of the patient must always be taken into due account. If extensive operations involving loss of large areas of skin, with slow, tardy and painful convalescence, are universally done in these cases, we shall soon have patients preferring the blandishments of the charlatan to the treatment of the surgeon. It has seemed to me that the earlier the cancer the more reason there is for a very "complete" operation. In widely-spread disease, it is as a rule hopeless to try to get beyond the limits of the malady. After undergoing the mental and bodily distress of a severe operation, the disease returns within six months at most, or makes itself apparent in some internal organ, where likely enough it had been silently progressing at the very time when an enthusiastic operator was attempting to eradicate its external manifestations by what is termed "heroic surgery!" Though it is now customary to remove well-marked atrophic carcinoma, I doubt that, especially in elderly women, this course is at all advisable. The records of these remarkable cases make it clear that they may live so long in comfort without surgical interference, that my personal feeling is strongly in favour of adhering to the ancient principles of surgery, and leaving them entirely alone, especially if the patient be over sixty years of age. We have yet no evidence that the removal of atrophic carcinoma will prevent subsequent visceral or osseous deposits.

It will be useful to point out as clearly as possible, the reliable data upon which the surgeon most depends, in answering the multiplicity of queries which patients and their friends shower upon him, in cases where removal of the breast is contemplated. It is well to mention also that this operation is naturally viewed, especially among the upper classes, with the greatest horror and repugnance, and unless the views and advice of the surgeon are perfectly clear and explicit, the operation will probably be delayed or refused altogether.

In the first place it is certain, that in very early carcinoma, free removal gives long freedom from recurrence. There is a strong probability that numbers of such patients if properly operated upon, survive over three years, with no recurrence, and they have the best chance of surviving for a much longer period, as six, ten, or fifteen years. We may thus, with perfect propriety, most strongly urge the operation in such cases. In many instances that are brought before us, the disease is unfortunately far more advanced. Either from mistaken delay in covering up a growing cancer with plasters or ointments, or from the natural tendency to concealment found in the unhappy subjects of these disorders, there will be a considerable tumour in the breast, with enlargement of the axillary glands.

A most serious responsibility hangs over the family medical attendant in these cases, and in a tumour of the breast in a woman he should never wait, as is too often done, until marked symptoms of cancer are evident, but urge immediate action or consultation, so soon as the growth is detected.

It must be acknowledged that the theory on which extensive operations on cancer of the mamma is founded, is the tendency for the lymphatic areas in connection with the mamma to be invaded by "infective" cells. It is curious that little or no account has ever been taken of the mediastinal lymphatics, which certainly communicate freely with the lymphatic plexus in the sternal margin of the mamma. Deaths in early carcinoma of the mamma are sufficiently rare, to render the investigation of this point a matter of peculiar difficulty. To carry out to its logical completeness the theory of lymphatic invasion by microscopical infective elements, it is obvious that every microscopical particle of lymphoid structure must be removed. The removal must not be confined to tissue which the operator is able to see. If tissue be left which is infected, though smaller than a pin's head, the operation is none the less surely incomplete. Considering the close association between such tissue and the vessels and nerves, I question very much if it is possible for any operator to dissect the axillary sheath, for instance, entirely free, pathologically speaking, of all the lymphoid tissue which may be infected. The more thoroughly this is done, however, the smaller will be the infected areas, and the longer will be the periods of freedom from or rather perhaps, to speak truly, dormancy of the disease.

It follows from this consideration, that operations for extensive cancerous affections of lymphatic areas, are seldom followed by anything like permanently good results, in the breast region, or elsewhere. The operations are severe, involving much removal of tissue and great distress to the patient in body and mind. When once cancer has spread into lymphatic areas, the removal of those areas, of the glands and infiltrated tissue, though surgically complete is not pathologically so. Tiny fragments of infected tissue are left, and the disease is surely reproduced. The published results of those surgeons who advocate and perform such operations afford occasional striking exceptions, but these are too rare to be reckoned upon seriously. If the theories of the extensive implication of the lymphatic areas, as demonstrated by Heidenhain are true, then it is equally true, that to do any permanent good to cases of carcinoma of the breast, these areas should be removed before they are seriously infected. Accordingly it is in early cases, when the tumour is small, and the surrounding tissues apparently free, that the surgeon should be most anxious and careful to remove every scrap of fascia from the pectorals and axillary region and every possible fragment of lymphoid tissue. He may thus hope to work beyond the disease, not through tissues microscopically invaded by it.

The more rapid the growth the greater the infiltration, the more fat and unhealthy the patient, correspondingly, the more does the case fall under the category of "doubtful." Such a case may be taken from one surgeon to another, and laying stress upon different circumstances, the various consultants give various opinions, which usually have the effect of still further distracting a sufficiently unhappy patient and her relations. At length some name, honoured by age or hospital distinctions, is mentioned, and the opinion thence obtained is to be considered "final." Any one who knows anything of surgical practice in large cities, will be aware that this is no exaggerated sketch of the truth. It exemplifies, that though statisticians have laboriously laid down periods of time for recurrence, for length of life and the like, yet when the test of practice arrives, surgeons are afraid to definitely rely upon the uncertain and flimsy data they have themselves created, and hence most unfortunate differences of opinion arise which distract and confuse patients! The questions that have to be met and answered are usually as follows:—

(1) How long will the patient survive if no operation be performed?

The answer to this query is impossible to give definitely, and the surgeon had better say so. He will do wisely not to commit himself to any distinct statement of time. In the acute mammary cancers the progress is rapid, so he may say that the patient cannot live long if secondary growths have appeared in the liver or brain. When cancers of the atrophic form occur in old persons, no one can estimate the length of time they will survive. The possibility of spontaneous retrogression, or temporary cure by sloughing must ever be before our minds.

Any surgeon who commits himself to "Horoscopic" statements regarding the number of months or years a patient with cancer will live is decidedly unwise. The answer can only be made, that in the ordinary cases of progressive carcinoma the majority of patients succumb within four years. In rapidly growing "brawny" cancer, in pregnancy or lactation, the period may be safely put down as within two years, but in the slowly-growing fibrous or atrophic cancer of women near sixty years old, no limit can be placed upon the length of time they may survive. Thus, by studying the type of cancer, and the resisting power of the individual, a tolerably correct estimate can be formed near enough to guide our patients in their decision. Also it is right for us to point out that the sufferings of the patient from fungation, discharge and hæmorrhage are usually notably increased by leaving the growth unchecked, and upon this argument especially, operation may often be legitimately urged.

No more excellent article on the prognosis of cancer was ever written than that of Velpeau. Although the estimates he forms of operations and their results will hardly hold good now, yet cancer is the same disease in its progress and results. He states that cancer left to nature never disappears. He is careful to mention the terminations in spontaneous sloughing, and atrophy, but these are apparent, not real cures, hence he lays down no distinct period of time in years, or months during which a patient with carcinoma of the breast, may be expected to survive, when no operation is performed.

(2) What are the risks of the operation?

An answer to this question is more easily given. Provided the operation is done by a surgeon, well accustomed to major operations, and with perfect asepsis, the proceeding is one of the safest of the larger operations of surgery.

The results of Halstead's most extensive operations, sufficiently exemplify this. Though an enormous wound is made, and both pectorals removed, he did not lose one case in fifty. Cheyne, in his very free operations, only lost one case in sixty. Such conditions as alcoholism, diabetes, chronic bronchitis, or advanced cardiac disease will, of course, render the prognosis more serious. The results of Bryant may fairly be taken as typical of the surgery of this country in the past fifty years. He estimates his mortality at seven per cent. Personally, I have operated upon forty-eight consecutive cases without a fatality, and others have escaped note, but I have never yet lost a patient from this operation.

The decreasing mortality of the operation for removal of the breast is well shown in the following figures collected from the practice of St. George's Hospital. In the early sixties, out of the first 100 cases 90 were operated upon, 9 died. The causes of this high mortality were various forms of sepsis in five, "shock" in two, hæmorrhage in one, and opening the pleural cavity with caustics in one. In the second 100 cases, 88 were operated upon and 4 died of septic disorders. In the third 100, 88 were operated upon and 2 died, the one of pneumonia, the other of erysipelas. In the fourth 100, 97 cases were submitted to operation, one died of congestive pneumonia another of sepsis.

Out of 34 fatal cases related by Halstead from Billroth's Clinic (*Annals of Surgery*, 1894, p. 536), all died from septic disorders except in two instances, when the patients succumbed to hæmorrhage from the axillary artery. The clinics of Czerny, Fischer, König, Küster, and Lücké all illustrate the same fact, that the essential danger of removal of the mamma is sepsis. The following table, taken from Cheyne's Lettsomian Lectures, *Med. Soc. Trans.* (vol. xix.) illustrates the mortality of some German surgeons:—

Operator.	Total Cases.	Mortality.
Fischer (Henry)	147	20%
Esmarch (Oldekop)	229	10%
Before 1863	—	—
After 1863	—	—
Rose (Fischer)	61	26·3%
Billroth (Winiwarter)	143	23·7%
Trendelenburg (Neuendorff)	97	11%
Lücké (Dietrich)	110	7·6%
Czerny (Schmidt)	150	4·4%
Krönlein (Horner)	144	4%
Küster (Schmidt)	222	10·8%
Bergmann (Eichel)	114	4·3%

In the pre-antiseptic days at St. George's Hospital, many of the patients were desperately ill from erysipelas, and very near death, and the avoidance of much misery and suffering by modern methods must be taken into account as well as actual saving of life. The cases were not "picked" but included cancer of both breasts, operations during pregnancy, in diabetes, and in cardiac disease. In the last 100 cases the practice of draining the axilla was very commonly followed. If a surgeon operating upon all cases, without rejection of those which are unfavourable from reasons like bronchitis or renal disease, confines his mortality to two per cent he will probably be fortunate, and after much consideration I believe this to be a fair estimate of the risks of the operation done with all modern precautions.

(3) *If the operation is performed will it "cure" the disease?* If by the term "cure" is meant the freedom from local recurrence beyond a period of three years, the results of modern surgery certainly enable us to predict this in confidence to a certain number of our patients, provided only that the operation is performed early and that the disease is not very extensive.[1] But if the patients wish us to positively state that the operation will prevent return either locally or elsewhere, will in fact definitely eradicate the disease for ever, like a fatty tumour or a simple ovarian cyst, then, I think, from want of knowledge of the nature of cancer, we must speak with great caution. We can confidently point out to them the saving of local misery and suffering usually afforded by the operation, and encourage them to hope that they may be the fortunate individuals whose lives are prolonged for periods of ten, fifteen, or twenty years. Furthermore, we may assure them of the great benefits, sometimes lasting benefits, to be obtained by repeated operations upon local recurrences, and to comfort them by the thought that even should the disease return, it is often again to be kept in abeyance by surgical measures of a quite minor kind.

By adopting some such line of reasoning as the above the surgeon will greatly encourage and reassure, and will not commit himself to definite statements so likely to be falsified by a hundred chances or circumstances, and therefore so likely to shake the confidence of the patient in legitimate practice.

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[1] On this point especially see a letter by myself in the *Lancet* for 21st March 1896. The opinions of the majority of London surgeons, as shown in the debate at the Med. Chir. Soc. in 1898, were not in favour of employing the word "cure" to cases of cancer of the breast, after a three years' limit of freedom from return.

Conditions favourable or unfavourable for Operation.— In deciding upon operation for cancer of the mamma, local and general conditions have to be decided. There are certain local conditions which, in the opinion of most, generally negative operation, or render it very unfavourable, and these may thus be summarised:—

(1) When the skin is extensively involved either in the form of "cancer en cuirasse," or where multiple shotty tubercles are scattered over the thorax. Where the integument is smooth and thickened, and covered with an erythematous blush, the local heat being raised.

(2) When the glands above the clavicle are involved.

(3) When there is evidence of carcinoma elsewhere as in the liver, spine, or pleura.

In any of these cases it may be justifiable to remove fungating masses of cancer to relieve the patient of fœtor, hæmorrhage, or discharge, but any extensive operations aiming at "cure" are seldom if ever justifiable.

(4) Implication of the axillary nerves in a mass of cancer.

The most favourable conditions for operations are found in slowly-growing tumours in spare elderly women with small mammæ. The cancers in such are hard and fibrous. Most unfavourable cases are soft rapidly-increasing tumours in young plethoric and especially parturient or lactating women, with marked infiltration of the pectoral muscle and axillary glands. Such cancers are often associated with local heat and tenderness, and the erythematous blush on the skin (cancer erythema). The blush is associated with infiltration of the skin with malignant deposit. The skin will always be felt thickened, by the fingers, in these instances. If soft infiltrating carcinoma attacks the breast, especially both breasts, of a parturient woman, I have doubts if operation is of any great value.

Between these varieties of the disease are a large number of cases inclining towards one group or another, but it will be found in practice that the advisability of an operation can best be determined by carefully estimating the nature of the case, and especially the probability of absolutely complete removal in extremely early cases of disease.

Out of 400 cases at St. George's Hospital, a certain number were not operated upon, and the reasons given for this course are instructive. Four patients refused operation for reasons of their own. Eleven were refused on account of extensive skin implication. "Cancer en cuirasse" accounted for two of these. Abundant nodules in the skin of the thorax were found in nine of the eleven cases. Ten were refused on account of implication of the supraclavicular glands. Seven were refused on account of infiltration of the thoracic parietes. Nine were declined because of deposits of cancer in the liver and elsewhere. There were thus two cases of cancer of the spine and femur, four of cancer of the rectum, and three of cancer of the liver. The number of cases of rectal cancer in association with breast disease is interesting. Operation was refused because of pregnancy in two cases, and because both breasts were affected in one.

A general examination of the patient in advising operations for cancer of the mamma should never be omitted. Vague pains supposed to be "rheumatic" should always lead to an examination of the bones, and the contents of the thorax and the liver should receive methodical investigation. Cardiac disease or chronic bronchitis should be carefully examined for. The urine should, especially in very fat women, receive careful examination for sugar and albumin. There is another investigation before operating upon carcinoma of the breast to which I will draw especial attention. It is the question of the presence or absence of alcoholism. Secret drinking in women is far more common than the young practitioner suspects, and he will here need all his acumen, but it is well to point out that nothing is more likely to lead females to the solace of drugs or stimulants, than the mental wretchedness caused by the brooding over a concealed tumour of the breast. It is very important that any injurious practices of this kind be detected, and if possible rectified before proceeding to operation. In several cases of this nature I have interdicted stimulants for a fortnight before the operations, and given small doses of blue-pill with purgative waters, and I have never had reason to regret the practice. In association with this it is well to point out that the mental condition of the patient should receive attention, for a feeble-minded or crazy woman is not unlikely to exhibit mania, or drift into imbecility, after an operation of severity, especially on the breast.

Very careful and elaborate cleansing of the skin should be carried out. The axilla and the fold between the mamma and thorax need careful attention. The day before the operation these parts should be well washed with hot carbolised soap and water, the axilla being shaved. The whole area of skin is then sponged with ether, and afterwards with biniodide of mercury lotion (1 in 1000). A large dressing of cyanide gauze wrung out in 1 in 20 carbolic lotion is placed over the whole area of operation, and not removed until the patient is anæsthetised. On removing this dressing the parts may be sponged over with 1 in 20 carbolic lotion. It is well here to mention that the operator must estimate the condition of the skin of the patient. Some women, especially in the upper classes, with fair and delicate skins, may get very troublesome erythematous rashes after the use of powerful chemicals, and in such the strength of the above solutions may be considerably modified. The hands and nails of the operator and his assistants must be carefully cleansed. Plenty of hot water and carbolised soap is to be used with a nail-brush, and this must be followed by a thorough soaking in a solution of 1 in 1000 solution of perchloride or biniodide of mercury. All the forceps and other blunt instruments must be boiled, and the cutting instruments soaked in pure carbolic acid for half an hour previous to operation. They are then placed in a solution of carbolic acid (1 in 40).

In cases of ulcerating carcinoma or sarcoma a far more careful cleansing of the parts is advisable. I have observed several cases of suppuration and erysipelas after operations for ulcerating scirrhus. Indeed, the ulcer itself may be attacked with serious erysipelas, with the usual curious improvement in the tendency to heal observed in such cases, or on the other hand the case may prove fatal.

All slough must be cut away, and I have found nothing tend to promote healthy granulations like a free application of the tincture of benzoin with a brush. When disintegrating tissue is removed, the parts may be well flushed with warm 1 in 5000 solution of perchloride of mercury, and at the time of the operation while the patient is under the anæsthetic, the diseased tissues must be carefully mopped over with liquefied carbolic acid. The parts treated turn white and dry, and any infection of the freshly-cut skin is thus probably prevented. The application of the cautery is even more efficacious, and this may be readily done at the time of operation.

When abscess is associated with ulcerating scirrhus, the former should be opened and its walls disinfected with pure carbolic acid, the incisions for removal of the carcinoma being carried far and wide of it. The same scalpel must not be used.

Mr. Lockwood advises that the skin of the hands and of the operation area should be soaked for two minutes in a spirituous solution of 1 in 500 biniodide of mercury, with a tenth part of hot water added. This is after the usual cleansing with soap, ether, or turpentine.[1] He speaks in no uncertain terms of the comparative risks incurred in operating upon ulcerating carcinoma, and relates the following cases, which are of extreme importance and interest.

A woman, sixty-two years of age, was operated upon for a rapidly growing and ulcerated carcinoma. "Many pints" of sublimate lotion were used for irrigating the wound and the axilla. The skin was dusted with iodoform. The patient died of septicæmia on the seventh day. The bacillus of septicæmia was found in the lungs.

A woman, fifty-five years of age, was operated upon at St. Bartholomew's Hospital for an ulcerated cancer of the breast with very foul discharge. Extra care was taken to disinfect the ulcer and surrounding skin; details of the disinfection are given, and just before the operation the surface was mopped with pure carbolic acid and covered with a layer of alembroth gauze painted with collodion. Notwithstanding these precautions the patient died of bacillary septicæmia. Bacilli were found in the foul discharges of the cancers, cultures of which killed mice in forty-eight hours. Commenting upon the extraordinary difficulty of preventing infection, as exemplified in the last related case, he advises entire destruction of the ulcerated tissues with the actual cautery before operating. For further details concerning these important cases the original lectures by Lockwood on traumatic infection may well be consulted.[1] The practical conclusion follows, to destroy or clear away disintegrating tissues as much as possible, and then to spare no pains to disinfect the granulating area at the time of operation by the cautery or powerful germicides.

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[1] *Aseptic Surgery.*

Position of the Patient—Preparation of the Room, etc.—The patient should lie upon a table of convenient height for the operator. He should not have to stoop down to his work. In private houses, if a proper operating-table cannot be obtained, a strong kitchen table should be requisitioned, and mattresses laid upon it until it reaches the proper height. The patient then lies upon the table, the arm hanging over the side.

The surgeon should see that all preparations are made the night before, as well as the arrangement of basins, towels, etc. etc. Nothing is more embarrassing for all parties concerned than to arrive at a house and find these precautions omitted. In such circumstances I have known surgeons proceed to operate on a bed, or sofa, a dirty and slip-shod practice which I cannot too strongly condemn. All needless furniture, ornaments, etc., should be cleared out of the room, and except in hot weather a fire should always be kept burning to maintain a warm and equable temperature. As in all operations, the sanitary conditions of the room should receive notice, and this is especially important in some London lodgings, and in many country houses, the neat and happy exterior of which serve as a cloak for much internal bad drainage and filth.

Preparation of the Instruments.—This should be carried on out of sight and hearing of the patient, and the list of instruments used for any ordinary case will comprise the following:—

Two large scalpels with rounded points.
A pair of blunt-pointed curved scissors.
Twelve pairs of pressure forceps.
One pair of spring forceps.
One pair of Liston's artery forceps.
One aneurism needle.

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[1] *Traumatic Infection*, p. 61 *et seq.*

One director or separator.
Retractors.
Needles.

In addition to the sponges or wool pads, which should be scrupulously aseptic, I always have prepared six towels, which are first boiled for ten minutes and then rung out in 1 in 20 carbolic lotion; they are used to cover the area round the wound and to place instruments upon.

Basins of 1 in 40 carbolic lotion should be at hand for the operator and his assistants to "dip their hands." Lately I have been using a solution of 1 in 1000 biniodide ot mercury, which is perhaps preferable. Whatever ligatures and dressings are selected by the operator should be prepared beforehand, and the drainage-tube should be carefully sterilised. The latter precaution is too often omitted. All basins should be rinsed with boiling water before the antiseptic lotions are placed in them. If a large wound is to be made, it is my practice to flush it with warm 1 in 4000 perchloride of mercury solution, and I have used simple warm water with perfectly good results.[1]

Choice and Administration of an Anæsthetic.—Great care should be exercised regarding this matter, which is of far more importance than usually believed. As a general rule, gas followed by ether is the anæsthetic I would personally select. In very fat women, especially if they are bronchitic or the subjects of cardiac disease, the after-effects of ether in inducing pulmonary irritation and congestion are often very injurious, and in such individuals chloroform, or the A.C.E. mixture given in a cone, with plenty of air, are in my judgment far preferable to ether. Again, in very prolonged operations, if the patient be "drenched" with ether, accumulation of mucus in the air-passages is very apt to arise, and this superadded to any chronic pulmonary trouble will probably prove fatal. In prolonged operations, I prefer the early ether anæsthesia to be kept up with chloroform during the later stages. Any undue exposure of the patient must be carefully avoided, especially in cold weather. The trunk and lower limbs should be covered with hot blankets, and the temperature of the room should be at 70°. Hot bottles should be placed close to the patient's feet, but not in contact with them. I have known serious burns of the feet to have resulted from carelessness in this respect.[1] Long warm stockings should be worn with flannel drawers which fasten round the waist. These precautions are of the first importance in operating upon a bronchitic subject, and often make all the difference between death and recovery.

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[1] I believe that the use of fluids to large wounds must be mechanical. If strong enough, chemically speaking, to destroy organisms, they must be dangerous to the patient.

The anæsthetist will keep the head upon the side during the operation to allow mucus, etc., to flow from the mouth. Towards the close of the operation, when the sutures are introduced, he will discontinue the administration. In prolonged and extensive operations, especially when the axilla is much interfered with, and there is considerable hæmorrhage, the anæsthetist will be prepared to encounter shock and collapse. This is to be met by lowering the head, the application of hot cloths, or enemata of warm beef-tea and brandy. The wound should be covered temporarily with a large piece of antiseptic gauze. Great care must be taken that the wound is not soiled by the anæsthetist, or discharges from the mouth of the patient.

Period and Time for Operation.—I prefer to operate early in the morning, say 9 or 10 A.M. This lessens apprehension. In an ordinary case nothing is permitted to be taken by the mouth beforehand, but in weak and debilitated subjects, especially should cardiac disease co-exist, a little warm, clear, strong beef-tea, with a few teaspoonfuls of brandy, may be given about 7 A.M. It is important in young women that the operation should not coincide with the expected advent of a menstrual period.

Question of Assistance.—A dexterous surgeon may perform the operation single-handed. He had better be content with one assistant, and handle the instruments and replace them in the lotion himself. Every "dresser" or helper adds to his sometimes questionable utility, an additional risk of sepsis. The operation should certainly be performed rapidly. Long anæsthetisation and exposure, seriously increases the risk of pulmonary complications. The surgeon should therefore at once commence at a signal from the anæsthetist, and not waste valuable time in talking or preparing instruments, which should already have been arranged.

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[1] I am aware of one case which occurred in the practice of a friend at a provincial town, where negligence on the part of the nurse in this respect led to a burn which exposed the tendons on the dorsum of the foot. The sore was long and tedious in healing, with much unhappiness to all concerned.

The Performance of the Operation.—The arm should be kept away from the side by an assistant, or secured by a wrist-bandage to the table. It should be held at a little more than a right angle to the trunk. Great stretching of the arm upwards should be avoided. This position throws the axillary vein which is more superficial than is generally known into prominence, so that a "dashing" surgeon, armed with a sharp-pointed knife, might wound this vessel more readily than a young operator is apt to believe. A large pad of boric or iodoform wool should be packed beneath the patient on the affected side, and a kidney-shaped vessel, previously rinsed in boiling water, should be held against the chest. This prevents the blood running over the back and trunk of the patient, and aids essentially in the after-cleansing.

Standing on the same side as the breast to be removed, the surgeon first cuts well into the supposed tumour by an incision radiating from the nipple in order to verify his diagnosis. Removal being determined upon, the scalpel used for this proceeding is laid aside, and taking the other knife the breast and growth are very freely removed. The assistant should stand opposite to the operator and draw upon the tissues as required, sponge, and apply pressure forceps.

As the only evidence of involvement of the axillary glands may be microscopical, I strongly advocate their removal in all cases. The lower incision is always to be made first. It should be carried very wide of any implicated skin in the neighbourhood of the tumour, and should reach from the apex of the axilla to near the sternum. This incision should reach into the subcutaneous fat, and its axillary termination or commencement should be cautiously made. The upper incision should again be carried very wide of implicated skin, and no consideration of after-closure of the wound should influence the surgeon. The leaving of infected skin is one of the most common and serious errors in breast surgery. The assistant, who stands opposite to the surgeon, now raises the mamma, and the operator dissects down an extensive flap, cutting away from the skin most of the fat, and being especially careful that no nodules of breast tissue are left behind. The difficulty of doing this efficiently is considerable, but traction on the mass above greatly helps the operator. In like manner the upper flap is raised almost as high as the clavicle. These extensive portions of skin should not be dissected quite bare and white. This is a common error, and tends to extensive sloughing. The breast is now detached from the sternum towards the axilla, and here especial care should be taken to remove the fat and prolongations of breast tissue which run towards the margin of the sternum. Recurrence from imperfect removal is here very common. In detaching the mass towards the axilla every scrap of fascia should if possible be taken with it, so that the bare fibres of the pectoral are seen in the wound. All spouting vessels are secured with pressure forceps rapidly. If this is not done the loss of blood in removal of a large vascular growth may easily become very serious, and what is termed "shock" is often in my experience due to this cause.

The clearing out of the axilla is thus affected. The axillary vein is first accurately to be defined by opening its sheath, and cautiously pulling away the fascia from it. Should any venous radicles of large size, as the subscapular vein, come into view, pressure forceps should be placed upon them, and they may then be divided with scissors. If the surgeon determines to preserve the pectoralis major, that muscle is raised with a powerful retractor, and all the fascia and glands, which lie beneath it, are detached. This manœuvre is aided greatly by the weight of the breast hanging below. Now with the fingers and a separator all the glands on the side of the thorax and towards the apex of the axilla, with their surrounding fat and fascia, are gradually separated. The sternal part of the pectoralis major is readily removed if thought requisite, by passing the fingers beneath its origin and insertion, and dividing it. The skin incision should be carried nearly as high as the coracoid, if the muscle be taken away. I doubt the possibility of removing extensively infected glands from the axilla without taking away the sternal part of the greater pectoral also, and I am advocating and performing this operation more and more as an essential step in the proper "clearance" of the axilla. I have, by removal of the sternal part of the pectoral, found and extirpated cancerous glands which would certainly otherwise have escaped notice, lying high under the pectoralis minor and embedded in soft yellow fat. Any vessels should be included between pressure forceps before being divided. A blunt-pointed, curved scissors is a most useful instrument in this part of the operation; it can be used as a separator as well as a cutting agent. Attention must forcibly be called to the danger of drawing upon vessels and cutting them off without including them in pressure forceps. An artery thus divided close to the axillary trunk is practically a hole in the main vessel. A most embarrassing hæmorrhage occurs high up in the axilla, and even if the part can be reached, sufficient vessel is, unfortunately, not left to hold a ligature. Consequently the main trunk has to be tied above and below, and though this has often been done with safety, the danger of the operation is materially increased. I have twice seen lives in great peril from this cause. The accident may readily happen unless the surgeon be aware of it. A common error also in operating in the axilla, is to make an insufficient opening in the skin and fascia, and through it to "burrow" and "tear" with the finger. The surgeon cannot too strongly be impressed with the truth, that to operate with ease and safety among important vessels and nerves, it is needful to well expose them, and this can here best be done by removal of the sternal part of the pectoral muscle.

A woman, aged sixty-seven, was admitted into St. George's Hospital on 23rd March 1893 for recurrent carcinoma of the left axilla. The left mamma had been removed two years previously. The left arm was now œdematous; there was a hard fixed mass in the axilla, and a fungating sore in the old cicatrix. On 30th March an operation was undertaken to remove the disease. Numerous large trunks were seen to enter the axillary mass; these were clipped, and when the glands were cut away, tied. It was found that one branch was cut so close to the main trunk that the hæmorrhage could not be stopped. Consequently the axillary trunk itself was tied above and below the wounded branch. The wound healed satisfactorily.

All the axillary tissues being thus detached, it will be found, if the operation has been rightly done, that the breast and lymphatic area have been removed in one mass right up to the axillary apex. With the most complete operation scraps of fat and fascia remain over the subscapular muscles and over the pectoralis minor. As far as possible, all such tissue must be dissected away, and next attention is called to the restraint of bleeding. If the operator desires speedy healing and absence of after-troubles from oozing, he cannot spend too much time or care over the absolute arrest of all hæmorrhage.

Many operators of great experience, notably in former times at Guy's Hospital, used to rely upon torsion of the vessels in these cases. Personally, I place far greater reliance on the ligature. I employ fine silk or chromic gut, well soaked in 1 in 20 carbolic lotion. Every bleeding point is carefully ligated, and as the patient may be somewhat faint and the circulation depressed, it is well to start the bleeding from any suspicious point by gentle friction with a sponge. I apply ligature after ligature until the wound remains absolutely dry.[1]

The operator may have considerable trouble with hæmorrhage from the perforating branches of the internal mammary artery, especially if these are of large size, and are pulled out and cut short in a woman with thin thoracic parietes. The vessel is then apt to retract behind the internal intercostal muscle, and blood keeps welling up in an embarrassing and persistent manner, quite enough to lead to separation of the flaps and to prevent union. The treatment of this condition will be best appreciated by the perusal of the following case.

On 17th August 1895 I removed a cancerous breast from a spare woman aged sixty. The nipple was ulcerated and the growth incorporated with the pectoral muscle, which was in great part removed with some of the external intercostals. A perforating vessel the size of a small quill was cut or torn, flush with the thin structures in the fourth interspace, about two inches from the sternum. It retracted and bled profusely and persistently. All methods of securing it failed, and a fine curved needle threaded with silk was "dipped" into the tissues round, but all to no purpose. A hare-lip pin was passed through the lower flap, and a small piece of sponge the size of a walnut was threaded upon it, and then the pin was passed from within outwards through the other flap. A figure-of-eight silk suture being applied, all bleeding was easily arrested by pressure of the sponge, and the flaps were also brought together. The pin was removed on the third day and the sponge on the fourth. The bleeding was perfectly stopped, and the case did well. With care, no trouble with secondary hæmorrhage should occur after removal of the mamma. Such an occurrence usually means insufficient securing of the vessels. Persistent venous oozing is, however, met with. I have never encountered this complication, but Gould has met with a case.[1] Such a complication would have to be met with styptics, as turpentine, and well-regulated pressure.

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[1] I am aware that operators of great experience object to "rubbing" of a wound. I can only say I have known bleeding points thus made apparent which would otherwise have escaped notice, and become serious sources of danger afterwards.

In exceptional instances in aged persons the thoracic and perforating vessels may be calcareous. This is a very troublesome complication. I have personally encountered one instance of this condition, in removing a "secondary" carcinoma from the axilla of a man aged seventy-five. On tightening the ligatures the vessels persistently broke off. The thoracic branches of the axillary vessel were like rigid pipes. Finally, pressure forceps were placed upon the vessels and allowed to remain on for twenty-four hours. On their removal in twenty-four hours all bleeding was staunched. Calcification of the mammary arteries is well exemplified by two specimens in the Hunterian Museum, from the collection of Sir A. Cooper.[2]

If the operation has been done properly the integument will be detached above, nearly as high as the clavicle and below on to the lower ribs. The extensive wound may now be irrigated. I believe that simple warm water is as good as anything for this proceeding. Those who prefer chemical solutions for this purpose will remember the enormous absorbent surface, and make their solutions exceedingly dilute. Carboluria is readily induced, and in the earlier days of antiseptic surgery I have seen several instances of it. A caution may be also given against covering such an extensive surface with iodoform.

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[1] *System of Surgery*, by Treves, vol. i. p. 547.

[2] 2811, 2812.

The opening for a large drainage-tube is to be made at the most dependent part of the wound, through the lower flap about opposite the mid-axillary line. The practice of bringing out the tube at the axillary of the wound is essentially bad, and sometimes leads to a troublesome sinus. The methods of uniting the wound are almost too numerous to mention, and so long as accurate apposition and freedom from great tension are brought about, healing will usually take place. The arm is brought towards the side before suturing. My own method is to rapidly introduce a series of silkworm-gut sutures along the whole extent of the wound, at intervals of about two inches, these sutures taking up and bringing together a liberal amount of skin. The edges of the skin itself are then sewn together with a continuous horse-hair suture, not applied with the tightness which leads to strangulation. The whole line of union is powdered with iodoform, and painted with styptic colloid, which thus practically seals the wound from the air. During the suturing an assistant is careful to squeeze out all blood and serum through the tube. I regard this last step as a very important one. Although many cases of breast removal will heal without drainage, I always think it safer to employ such a precaution for twenty-four hours. The tube being then withdrawn, the operator can ensure that the flaps are not separated by serum.

In obese patients, when a very large cavity is left, I advise the introduction of two tubes; one in the axillary region as usual, the other at about the centre of the wound. Serous collections are very apt to accumulate in the latter situation, and I strongly urge this complete drainage in cases involving the formation of a very deep cavity.

Removal of the mamma integument and axillary tissues in one piece, with careful stripping of the axillary and pectoral fascia, is the ordinary operation I would advise. As I hold strongly that no one can ascertain infection of the axillary glands in the very early stage, I would urge their careful removal in every case. Excision of the sternal part only of the pectoralis major adds little to the severity of the operation, and does not much impede the after-use of the arm. The pendulum of surgical opinion is apt to swing to extremes, and without absolutely condemning such operations as those of Halstead, I feel sure they are not needful in every case, and their "weak point," their incapacity to prevent visceral metastasis, is a defect which at present I cannot leave out of notice. I do not believe, however, that removal of the sternal part of the pectoral adds much to the risk of operation, if asepsis be ensured and pressure forceps properly used. It is rapidly done, and the way enlarged glands can be detected and removed after this step is very striking.

Operations on Peripheral Carcinoma. — Special mention must be made regarding operations for cancers growing at the extreme limits of the mammary gland, on account of the difficulty of adequately removing them. Taking one common and unfortunate position, in the sternal side of the breast, if the usual incision be made, the end of it will be over the growth, the centre far away from it. The consequence is that infected skin and fascia will be left for a certainty, and speedy local recurrence is probable.

Consequently very free removal of the skin should be planned by oval incisions which "tail off" towards the axilla. The operator will find that these cases are very insidious, and that the adhesion and implication of the chest-wall is far more serious than appeared before the operation. In cases of peripheral scirrhus which are definitely fixed to the chest-wall and do not move upon it, little or no good comes of operation in any form. Great care must be taken, especially in this form of cancer, that the thorax be not opened in pursuing the growth through the intercostal spaces, and if the perforating vessels are cut off deeply, trouble with hæmorrhage may be expected. It follows that operations upon peripheral carcinoma must be undertaken with peculiar caution, and this is the more important to impress upon inexperienced surgeons, for these growths often appear simple and trivial, and the external appearances are no criterion of the implication insidiously progressing beneath.

I wish distinctly to point out that I advocate clearing the axilla in every case of mammary carcinoma, whether enlarged glands can be felt or not, and the following case illustrates well my reasons.[1] Many similar ones could be quoted.

In October 1897 I operated upon a lady about sixty years of age, who had in her left mamma, which was very voluminous, a deeply-seated lump the size of a pigeon's egg. The skin and nipple were unaffected, and the most careful examination failed to detect anything in the axilla. On exploratory incision, after dividing a deep layer of yellow fat, a nodule of carcinoma was exposed almost upon the pectoral fascia. The whole mamma and pectoral fascia were fully removed. The axilla was opened, and the fascia and lymphatic tissues peeled and cut away. No glands were detected. Almost at the end of the operation I passed my finger deeply beneath the lesser pectoral, and at once detected a single cancerous gland the size of a broad bean. It would have been impossible to have felt this without opening the axillary cavity, and the operation would have been completed with a definite lump of carcinoma left behind in the tissues. I fear this is too often the case in the practice of those surgeons who do not explore the axilla as a routine measure.

It is easy to understand that where opinions of eminent surgeons differ so widely, an author may well hesitate before pronouncing strongly in favour of any one method of operation. The following rules for guidance are founded upon a careful consideration of London practice by the more junior surgeons at the present day.

(1) On no account are operations of a partial or incomplete nature to be done, unless in some exceptional instances of cancer in an accessory mamma quite free of the breast.

(2) The axilla is to be opened in every case, the pectoral fascia and all obtainable glands to be removed.

(3) The removal of a large area of skin with both the pectorals is reserved for advanced cases. The operation is yet on its trial, and the majority of operators do not adopt it in ordinary cases where the axillary glands are not apparently infected.

My own strong predilection for removing the sternal portion of the pectoralis major in all cases where the axillary glands are extensively infected has already been expressed, and I believe this operation will be the ordinary one in vogue. It does not add materially to the time of the operation or hæmorrhage. Both of the latter considerations are of vital importance in obese or diseased subjects.

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[1] I am aware that this view is not shared by several surgeons in London of experience and position.

The Dressing.—It is useful to employ a "domette" many-tailed bandage after removal of the breast. I have been struck with the difficulty of holding up and bandaging a fat and heavy woman in the ordinary fashion.[1] The blood having been all cleared away from the skin, the "many-tailed" bandage is placed behind the back with the ends conveniently brought out on either side of the patient. A large piece of "green protective" is laid over the wound, and the end of the tube is brought through an opening made in it. This prevents the sticking of the gauze to the sutures, often a source of pain to the patient in the after-dressing. It is a good plan to apply a large, flat, soft sponge, or a layer of soft wool, well purified and enclosed between folds of iodoform gauze. Over this is placed the customary dressing of iodoform or cyanide gauze and wool. The dressing should be very large, and the gauze and wool liberally arranged posteriorly, over the region of the tube where alone discharge of blood and serum will take place. The bandage is now applied from below upwards and pinned with many safety-pins, and the arm confined in a large comfortable sling. The uppermost ends are brought over the shoulders on either side from behind forwards, and being securely pinned in front, prevent the bandage from slipping down. I am much against the rigid bandaging of the arm to the side, which patients usually complain of very bitterly, and which I believe serves little useful purpose. The bed should be a hard flat one, and for two hours after the operation the patient should be kept lying on the opposite side to the operation wound, so that mucus and vomit may run easily out of the mouth. The tendency to sickness and bronchial accumulation is much lessened by adopting this posture, and I regard it as very important. On the return of consciousness, the nurse should, as far as possible, keep the patient reclining against a bed-rest or pillows, and not allow her to sink down into the bed in the dorsal position, for this much favours congestive conditions of the lungs in those who are bloated, intemperate, or aged. It is my usual practice to dress the wound on the second day, and to remove the tube. Antiseptic dressings are then reapplied, but without the sponge pressure. As a rule this second dressing may be left undisturbed until the tenth day, when every other gut suture is removed. On the fourteenth day all the sutures are removed, and the wound being then well united as a rule, a dressing of boric ointment is applied, and a large pad of soft wool. In ordinary circumstances, I get the patient out of bed about the fourth or fifth day after the operation, and let her sit up for a few hours daily in an easy-chair. These cases are often kept in bed far too long. I know of no special precautions as to

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[1] The movements necessitated by the usual mode of bandaging are apt to bring on vomiting, and the dressings may become soiled.

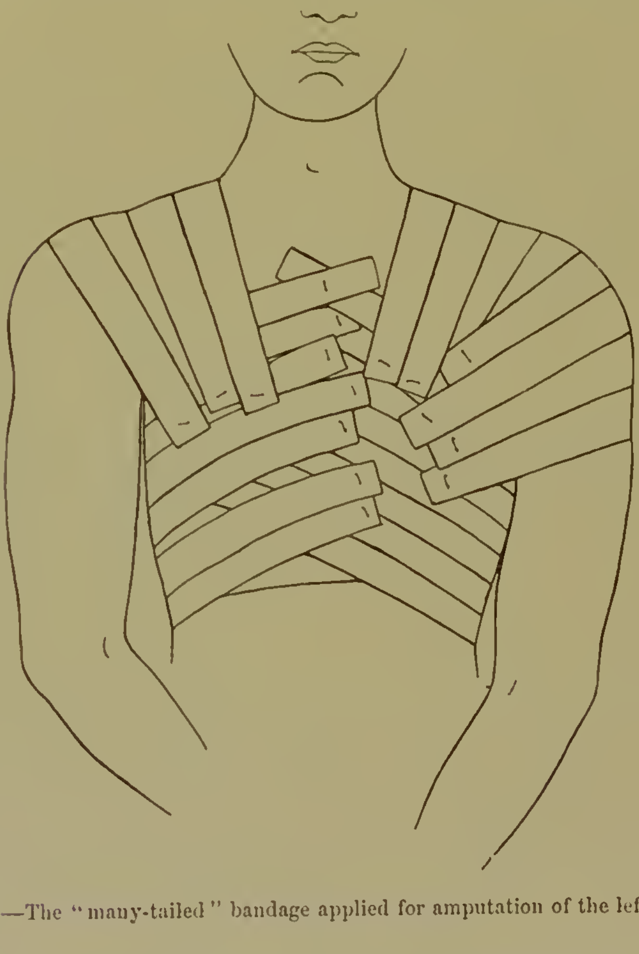


FIG. 53.—The "many-tailed" bandage applied for amputation of the left mamma.

dietary after breast operations. Each case must be managed on general principles. I regard it, however, as very important that the sutures should not be too soon removed.

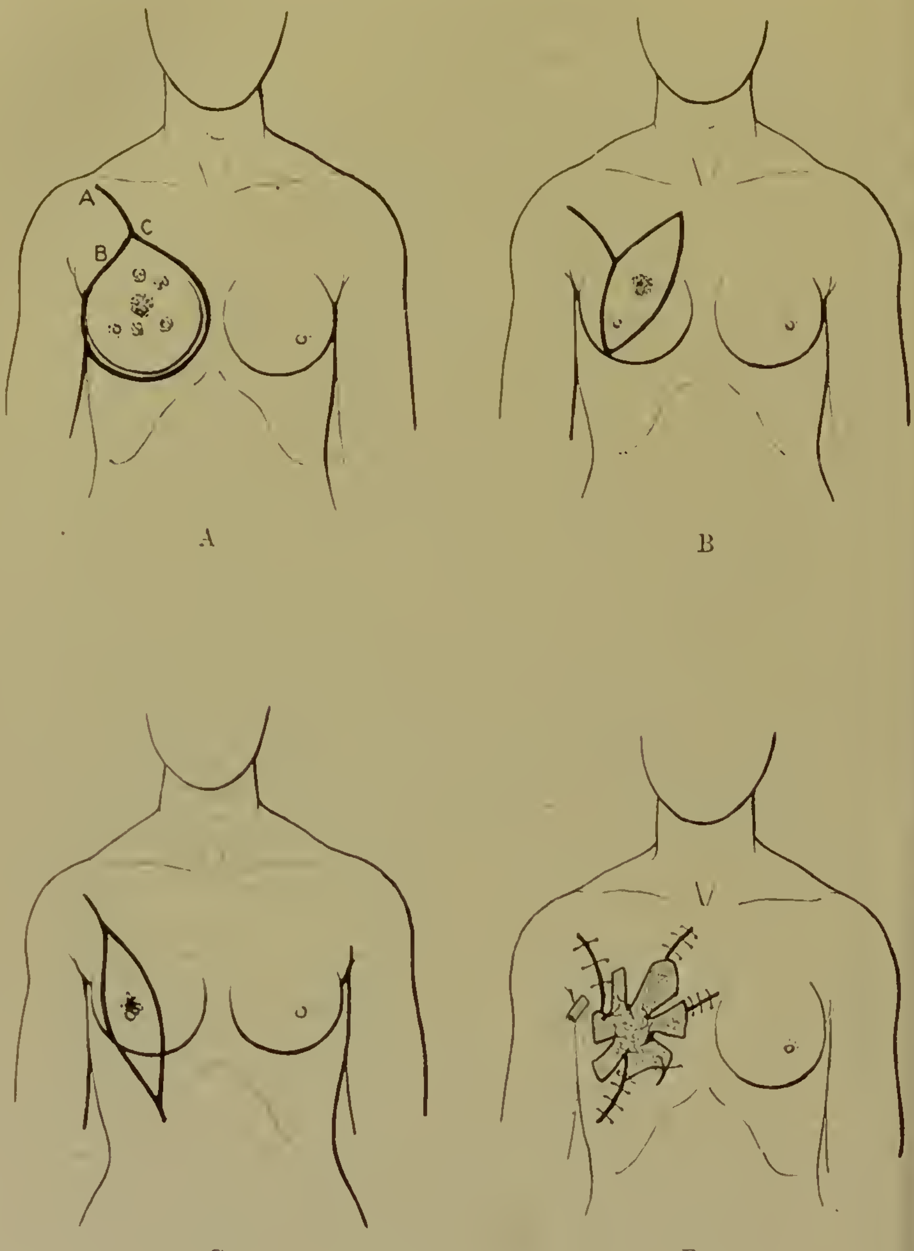
The union of an aseptic wound is always speedy, but often at first feeble, and may yield if the supporting sutures are too early taken away.

A woman, aged forty-one, was readmitted into St. George's Hospital on 12th October 1878. Three weeks before, she had the left breast amputated for carcinoma, and the wound healing rapidly, she was discharged. Three days after, the whole wound rapidly reopened. She had to be readmitted, and the parts only tediously healed under strapping.

In ten days' time, movement of the arm in the upward direction should be cautiously practised. It has been advised to apply a splint in these cases, but contraction in the axilla can be obviated by early movement regularly carried out.

Such being the proceedings to be adopted in ordinary cases of carcinoma of the breast, it remains to point out that the operation is often much modified by circumstances. In the first place, the situation of the growth at one or other margin of the breast may lead to alterations in the lines of incision, which may have to be placed almost vertically. When free removal of skin is needful, especially in peripheral cancers, integument from a non-infected area may often be brought over the wound. In all these respects each case must be judged on its own merits, and there is generally ample room for the exercise of ingenuity on the part of the surgeon.

At a meeting of the Medico-Chirurgical Society, April 1896, Mr Butlin, with whom was associated Mr. Adams, read a paper on the "Transplantation of skin flaps for the filling up of considerable defects after amputation of the breast." In cases in which it was necessary to remove large areas of the integument in operations for cancer of the breast, rapid healing of the wound and subsequent contraction might often be prevented by transplantation of flaps of skin in the immediate neighbourhood of the wound. He had employed this method in fifteen or more cases, and had generally employed the method of transplantation by rotation. The flaps should not be more than three and a half or four inches in length. They should have large bases. Flaps were more easily procured on the lower margin of the wound. Asepsis was not the only condition necessary to ensure the vitality of the flaps. The best cases for transplantation, and the best scheme of transplantation for the majority of cases, were discussed. Butlin had found that tension on the flaps was of comparatively small importance in determining sloughing. Cheyne said that he always removed a large amount of skin in amputation of the breast—all that which lay over the prominence of the breast. At first in these cases he performed skin-grafting, but afterwards he found that undermining was a better procedure. He carried this out in all directions, quite up to the neck and down to the abdominal muscles, and he drew the edges together with stout silver wire passed at a distance of about an inch from the edges of the flaps. The only condition necessary to enable this manœuvre to be carried out was that the wound should be oval. The stitches of relaxation would sometimes cut through, but this made no material difference to the result. In about 10 per cent of the cases in which stitching together by these means could not be done he had employed flaps and skin-grafting. An objection to the operation by flaps was that the patient was already often collapsed after an extensive dissection of the region of the breast, and the plastic proceeding certainly added considerably to the length of the operation. In such cases, where collapse was present, he stitched the wound together as much as possible, and then in three or four days skin-grafted the remainder of the wound. Cases treated in this manner did very well indeed, and he had very few failures after skin-grafting. Barwell asserted that he was in the habit of using large lead button sutures where the tension was greatest, and he frequently relieved the stretching by making incisions parallel to the wound edge, and then sewing these latter up in a direction at right angles to the wound edge. As he believed that the resistance was chiefly in the subcutaneous tissue, he was careful to divide any prominent fibrous bands that presented themselves. Bowlby said that the patients appeared to suffer more pain when the flaps were dragged together, and that the patient was more hidebound with the dragging than with the flap method.



A

B

C

D

PLATE XVI.

Diagrams of unusual incisions for mammary carcinoma. A, Halstead's operation. B, Carcinoma at the upper margin of the breast. C, The vertical oval incision. D, Multiple skin-flaps sewn down upon the raw surface, after very extensive removal of the integument.

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Cases in which the tumour extended towards the clavicle or towards the sternum were more suitable for flaps, while the wounds extending towards the axilla came together better by dragging. Mayo Robson declared that it was only in the exceptional cases that he used the flap method, and he agreed that in all cases, undermining and dragging were better where possible, taking care that in all cases where dragging was resorted to the stitches should be placed well away from the edge of the wound. In his flaps he took the whole thickness of the tissue, and he had done it in stout people as well as thin ones without producing sloughing. He used no drainage whatever.

Any exposed surface may be treated by implantations of skin flaps, by the method of Thiersch, or by the ordinary method of skin-grafting. I prefer to postpone skin-grafting until the tenth or fourteenth day. If the cellular tissue especially below over the ribs be extensively incised, the skin flaps will generally be brought together. Should there be great tension, the old-fashioned quilled suture is very useful, and superior, I think, to the lead buttons designed by Lister. I am averse to bringing the flaps together if there be great tension. If large gaps are left, a most useful plan is to dissect up numerous tongue-like flaps, and sew them by fine catgut on the floor of the wound. This leaves a multiplicity of centres for epidermis to advance over the surface. The process can be with advantage repeated at intervals of a month or five weeks, and this has given me better results than removing skin grafts from other parts of the body.

What operation is to be done in peripheral scirrhus, when the nodule is quite or apparently free of the breast? Unfortunately there is difference of opinion in these cases, and patients will seldom consent to removal of the breast from tumours apparently not connected with it.[1] I believe that very wide and free removal of the skin and cellular tissue is also advisable in these cases, and the whole gland and axillary area should be removed. If the patient will not consent, it is justifiable to remove the growth only. Cases are not wanting of remarkably good results after removal of these peripheral growths alone, but I believe that such would have been still better if removal of the whole gland had been carried out. For instance, Gould speaks of a case where he removed a carcinoma affecting an outlying lobule of the mamma. The patient was well for over three years, and then the disease returned, not in the breast, but in the scar.[1]

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[1] I have stated, in contradiction to the opinions of many, that cancer in accessory mammæ is rare, the apparent accessory gland is generally connected with the rest of the mamma by a process of gland-tissue, along which infective elements readily spread.

In connection with this difficult subject, the value of such researches as those of Stiles and Johnson comes prominently before us, morbid epithelial proliferation being so commonly present in the breast-tissue, even at a great distance from the primary growth.

Great implication of the axilla may lead an inexperienced operator into serious trouble. The axillary vein will sometimes be found completely incorporated in a mass of growth. Under these circumstances, the portion of vessel should be removed between two carefully tied ligatures, the pectoral being previously removed if needful. I have on several occasions removed large portions of the vein myself, and have often seen it done by others, little or no œdema of the limb occurred, and a good recovery followed. Should the nerve cords be extensively bound up in disease, the only method of complete removal is the amputation of the arm at the shoulder, or the removal of the upper limb and scapula. Under such circumstances, it is well to close the wound, and take time for reflection and consultation with the patient and responsible persons, before proceeding to operations involving such serious removal of parts for so problematical a benefit.

I must here draw the attention of inexperienced operators, to the ease with which the thoracic cavity may be opened in removing an adherent carcinoma in a thin woman with a long and sharp-pointed scalpel. An unfortunate occurrence of this kind, where the internal mammary artery was wounded, once led to an action at law between the surgeons of one of our largest metropolitan hospitals. I have witnessed this accident myself. The wound in the pleura was united with catgut and all went well, but a slight pneumothorax existed for some days.

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[1] *Practitioner*, April 1895.

A woman aged forty-seven had the right breast excised for carcinoma. Four local recurrences were dealt with in the following six months. A mass as large as half an orange was firmly fixed over the fourth and fifth rib cartilages of the right side. On removal the intercostals were found infiltrated. The fourth rib cartilage and extremity of the fourth rib were removed, and in doing so the pleura was accidentally opened. The patient recovered well, the wound uniting by the first intention.[1]

Cases are related in the Registrar's notes at St. George's where the pleural cavity was opened in removing an adherent mass of recurrent carcinoma from the pectoral region, and also in the removal of a cancerous breast by caustics. The former case recovered favourably, but the latter died of general sepsis and pleurisy.

A woman, aged seventy-six, was admitted into St. George's Hospital on 19th May 1883. She was married and had had one child. There was a "lump" growing in the left breast for two years. It had lately ulcerated. The nipple was retracted, the skin puckered and adherent, and in one place ulcerated. The tumour was adherent to the pectoral muscle. There was a large hard brawny mass in the axilla, and a huge abscess between the nipple and axilla. The abscess was incised and much pus was evacuated. The tumour and pectoral muscles were then removed. In doing so the pleural cavity was opened, as evidenced by a "loud sucking noise on respiration." The wound seemed to have suppurated, but ultimately healed well, and the patient recovered.

Halstead's Operation.—When the pectoral muscle is involved, as proved by fixation of the breast upon it, the muscular fibres must be very freely removed, and, generally speaking, it is in these cases that the operation of Halstead and Meyer[2] would be adopted in this country. I question much whether the majority of surgeons would agree to carry out this very complete and extensive operation in all cases of breast cancer presented to them. I wish to inculcate the doctrine that no one kind of operation can be applicable to cases of such infinite variety as those of mammary cancer. It is my own belief that this procedure should be reserved for cases, where the pectoral muscle and fascia are markedly involved, in strong individuals. The essentials of the operation are the removal of the breast muscles and axillary glands in one piece. Halstead claims excellent results from fifty complete operations of this kind, local recurrence occurred only in three cases. Moreover, he declared that the disability produced by the operation is slight. It is right to point out that Volkmann as early as 1875 advocated free removal of the pectoral fascia and muscle. Halstead points this out, and says that Volkmann excised the pectoral muscle in thirty-eight cases.

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[1] *University College Hospital Reports,* 1888, p. 92.

[2] *Johns Hopkins Hospital Reports,* vol. iv. p. 297, 1894.

For full details of Halstead's operation and its results, the article in the *Annals of Surgery*, 17th November 1894, is well worth perusing. The following is a very short account of the operation :—

A large triangular flap of skin is reflected, ACB (Plate XVI. Fig. A). The incisions round the breast are deepened until the costal attachments of the pectoralis major are reached and divided. The clavicular portion of the muscle is divided close to the clavicle. Special attention is shown in removing the fascia under the muscle, especially beneath its clavicular portion. The muscle is divided close to its sternal attachment. The whole mass of breast muscle, fat, and fascia is stripped from the thorax and ribs and pectoralis minor. The pectoralis minor is divided about its middle, and the fascia covering it dissected away. The small vessels under the pectoral must be detached with great care and carefully ligatured, and any fat must be cleared away as it is often cancerous. Having now exposed the axillary vein, the contents of the axilla are dissected away, and the vein dissected clean with a sharp knife.[1] The last stages in the operation are to strip the mass from the walls of the thorax, and finally to clear it from the posterior axillary wall; in doing this the subscapular vessels are exposed, and can be clamped before they are divided. The subscapular nerves may be saved, if possible. The vessels are clamped before they are ligated, and the operation should be nearly bloodless.

As regards the loss of function of the arm, this is far less serious than may be expected. In April 1897 I saw a woman, aged forty, upon whom I performed this operation six months before, removing also the greater part of the lesser pectoral.

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[1] This method is not recommended by the writer to inexperienced operators.

Her arm, though restricted in movement, was very useful, the scapula being movable upon the chest, much after the fashion of what occurs in an old anchylosed shoulder. I have since seen two cases, however, where the arm was œdematous, useless, and painful, and they impressed me that the results of this extensive operation were not always good.[1] The large skin flap dissected downwards should leave the subcutaneous fat untouched. The extensive wound left after removal of the breast by this method can only slowly heal by granulation or organisation of blood-clot. The cavity is brought together as far as possible with a "purse-string" suture, and drainage is seldom needful. The mortality is very small if full antiseptic precautions are adopted. Yet such great operations must entail corresponding increased risk to life in feeble or old bronchitic subjects.

A good illustration of the increased danger that must accrue to feeble patients, even under experienced operators, in very extensive operations on the breast and axilla for advanced cancer, is published in vol. i. of the *Reports of King's College Hospital.* The patient was forty-seven years of age, and an extensive operation was performed, under nitrous oxide gas and ether. The operation lasted about an hour. At the end of it the patient became so collapsed that she was unable to bring up the mucus from the air-passages. Her death, which speedily followed, is attributed to ether; but it is also hinted that, from weakness induced by the disease and the prolonged operation, she was unable to expel the secretions from the trachea.

I should personally reserve Halstead's operation for cases where the skin was extensively involved, and the pectoral muscle also. I would not perform it in feeble persons.

Cancer of both Breasts.—The question of operation in cancer of both breasts is always an anxious one. Especial care in these cases should be taken to verify the diagnosis by exploratory incision. A patient may have a cancer in one breast and a cyst or patch of mastitis in the other. Provided there are no visceral deposits and that the glandular implication is not too extensive, these cases should certainly be submitted to operation. But the question of the existence of general metastasis must be most carefully considered, especially in young or parturient women.

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[1] Mr. Treves referred to the bad results he had witnessed after extensive operating, so far as regards movement of the arm (Debate at Med.-Chir. Soc. Feb. 1898).

If the mammæ are small, both had better be amputated simultaneously. If they are large, and very extensive wounds are to be made with the probability of a prolonged operation, it may be wiser to postpone the performance of the second operation until the wound caused by the first one has healed. No fixed rule can be laid down for these operations, which must be carefully considered in all their bearings. Mr. Gould is an advocate for removing both breasts at one operation provided there are no visceral deposits.[1] It is not uncommon for cancer to recur in the opposite breast at a variable period after the first operation. Should there be no visceral cancer, and should the local and general conditions permit, the second operation should always be advised.

A marked case of the excellent results of this method occurred in the private practice of Mr. Pick, and he has kindly communicated the particulars to me. A lady, aged about forty, had the left breast removed for undoubted carcinoma. Six months after, the disease appeared in the opposite breast. This was also removed. Eight and a quarter years after she was perfectly well. There was no sign of recurrence. The growth was verified by the microscope, and the axilla was not opened on either occasion.

When both mammæ have been removed a woman may afterwards bear children without inconvenience. R. Lee related such a case. Here the patient, who had both mammæ removed for carcinoma (?), bore no less than five children, and nothing occurred save some slight fulness of the axillary glands.[2] This case is of importance, for the question may be readily raised in a married woman not past child-bearing.

Operative Treatment of Recurrence.—It is quite impossible to lay down any hard and fast rule that will apply in all cases, but the following considerations will be of great value to the surgeon. Instances are not wanted to demonstrate what is generally known, that even repeated operations upon localised recurrent carcinoma of the scar, or region of the scar, are hopeful in extending life. Mr. Clement Lucas was one of the first to draw attention to the value of repeated operations on recurrent carcinoma. He claims to have prolonged life in one of his cases for upwards of eight years.[1]

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[1] *Practitioner,* April 1895.

[2] *Med. Times and Gazette,* 24th July 1858.

Under the following circumstances operations are generally unadvisable upon recurrent carcinoma:—

(1) Where there are extensive shotty deposits over the skin of the thorax or trunk, or cancerous infiltration of the skin leading to the conditions known as "hide-bound" cancer with cancerous erythema, any operation is out of the question.

(2) When the glands of the neck are infiltrated, and where there are signs of mediastinal growth or pleuritic effusions. Where the walls of the thorax are themselves implicated in the mass, which is fixed and deeply seated.

(3) When the liver or other internal viscera are involved, and when there are symptoms of cancer of the spine or bones.

(4) When the axillary vessels and nerves are enclosed in an adherent mass.

The favourable cases of recurrence, for operation, are local nodules in the scar or axilla that permit of free extirpation. The most careful search should be made in the subclavian triangle, for a hard fixed gland often lies deeply, behind the sterno-mastoid, and may be readily overlooked. An extensive operation may then be done in the axilla, a serious focus of disease being left untouched above. After operations for carcinoma of the mamma, patients should submit themselves for inspection at stated intervals, and any sign of recurrence should be freely dealt with while yet in an early stage. The encouragement and advantage of thus treating these conditions should be clearly pointed out.

It may here be mentioned, that if patients have primarily undergone very severe and extensive operations with protracted suffering before convalescence, they will seldom submit to any more surgical procedures. I believe if the true ultimate results as to recurrence, in cases of advanced breast cancer, where such operations as amputation of the arm or removal of enormous areas of infected tissue have been adopted, were universally recorded, and generally known, such operations would be discountenanced by surgeons of sound judgment, and seldom permitted by patients or their friends.

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[1] *Brit. Med. Journ.* 1st September 1888.

Berger's Operation—Removal of the Upper Limb with the Scapula.—In cases of recurrent cancer of the axilla, associated with very great œdema of the arm and excessive pain, this extensive operation has been suggested. It has been most generally performed for malignant growth affecting the shoulder-joint. In some cases of recurrent cancer involvement of the nerves and vessels is too extensive to allow of extirpation in the ordinary manner, and amputation at the shoulder leaves infiltrated tissues on the face of the stump. The sufferings of some of these patients are so grievous that this operation, which involves extensive wounding, is certainly justifiable, and its dangers are far less than one might *a fortiori* believe. Extensive implication of the glands at the root of the neck negatives its performance. The mortality of this formidable operation in non-traumatic cases has been not much more than 20 per cent. For full details of its performance, the surgeon, who may feel justified in recommending it in some exceptional cases, is referred to recent works on operative surgery.

The sufferings of the patient must be very severe to justify so extensive and disfiguring an operation. I have never performed it in recurrent cancer, having not yet seen a perfectly suitable case, and I do not think it is often done in London practice.[1]

In cases of severe and intolerable pain, when the cervical glands, or those in the axilla, are much enlarged and appear to embrace or compress nerve trunks, operative measures are indicated. An excellent instance of the value of this practice is related by Banks:—[2]

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[1] My colleague, Mr. Dent, has had, while these sheets are passing through the press, a highly successful case. The axillary nerves were implicated in a mass of cancer, and the sufferings of the patient threatened to become very grievous. It is too early in this case to estimate the after-results. Four cases have been published up to this date, in the practice of this country of this operation, done for recurrent cancer.

[2] *Clinical Notes*, 1884, p. 59.

In a case of recurrent scirrhus, where the cervical glands were affected and the pain intolerable, an incision was made along the posterior margin of the sterno-mastoid and another along the clavicle. The subclavian triangle was dissected and several enlarged glands "peeled off" the nerve trunks. From the moment the patient recovered from the chloroform she experienced relief from her former pain.

I have had an equally successful case, and would point out that the glandular masses may sometimes readily be removed from the nerve trunks by splitting them in half, and peeling the two "halves" of the infected gland away from the nerve. Such operations done in the neck are only designed for relief of suffering, and the operator need not be tempted to "cure" the disease by an extensive operation which may lead him to wound the pleura or tear the subclavian vein. Before, however, contemplating such proceedings as Berger's operation, the surgeon may carefully consider whether local relief cannot be afforded, by some such minor operative measures as are here indicated.

Recurrent Cancer in the Axilla.—The question of removing recurrent axillary cancer is always an anxious one, and the same remarks apply to axillary infection in primary disease. The surgeon may rely, that the extent of the disease is always greater, than any one might estimate from external observations and manipulations. The one structure most commonly implicated in the growths is the axillary vein. The nerves and artery very commonly escape. The following case will illustrate the sort of difficulties a surgeon may meet with and the method of operating.

In December 1896 a spare thin woman, aged fifty-three, had a mass of recurrent disease in the axilla which reached nearly as high as the clavicle, and especially implicated the inner wall. The breast had been removed for carcinoma six months before, but the axilla had not been opened. There was no œdema of the hand. The operation was conducted under conditions of asepticity as follows. An incision was carried from the coracoid process down over the pectorals into the axilla, and was there made to include a large area of affected integument. The skin and fascia were dissected away on either side. The pectorals were removed by cutting through their thoracic and outer attachments. The mass was then detached, the vessels being included in pressure forceps before their division. The axillary vein was next ligatured below the point of communication with the cephalic, and as it ran through the mass was removed for about three inches of its extent. The whole disease was thus removed with trifling loss of blood. The after-progress of the case was perfectly satisfactory, the wound rapidly uniting with little pain and no fever. The division and removal of the pectoral muscles strikingly facilitated an operation that otherwise would have been most difficult or impossible. This was just a case, where the careless practice of drawing down and cutting off masses of disease, through an insufficient incision, might have led to the most serious results.

A case will now be quoted, which illustrates some of the points which render a case of carcinoma of the mamma unfit for operation, on account of extensive axillary infection.

A thin, anxious-looking woman, aged sixty-four, and appearing older, was admitted into St. George's Hospital on 27th December 1895 with an ulcerating growth of the left breast, which she asserted had existed for three years. She had become much thinner lately, and had suffered some shooting pain, but not of a severe nature.

The left breast was small, shrivelled, and infiltrated with carcinoma at the outer and upper part. The nipple was markedly retracted, and the skin involved by a foul irregular ulcer with hard and everted edges. The axillary glands were a little enlarged and fixed, but just beneath the clavicle, and indeed adherent to that bone, was a hard, indurated mass the size of a split walnut. There were also infected glands in the supraclavicular fossa. The diseased mass was slightly movable on the pectoral muscle. There were apparently no other cancerous deposits. At a consultation on 1st January 1896, it was decided that no operation should be performed. The woman was suffering but little, and the growth was slow in progress. Berger's operation was negatived on account of the implication of the glands in the neck.

Enlargement of the superficial veins, and œdema of the chest wall as well as the arm, usually mean the presence of intrathoracic growth. This is a very important point, and generally negatives external operations. To impress this matter upon my readers I quote the following case:—

A woman, aged forty-two, died in St. George's Hospital on 21st June 1897. She had extensive carcinoma of the right mamma and integument of the thorax. The left mamma was also affected. The chest wall was œdematous, and mottled with enlarged tufts of venules. On removing the sternum abundant plates of cancer-like droplets of wax were seen at the back of the bone. The left innominate vein was compressed by a mass of growth the size of a filbert. Cancerous glands surrounded and pressed upon the vena cava and right innominate vein, which accounted for the excessive œdema of the right arm. The autopsy was made by Dr. Latham, and the figure (54) is drawn from a sketch made by

Mr. Wilson. The moral of this illustration is obvious. Before advising "heroic" operations for cases of cancer associated with œdema of the arm great care must be taken to negative intrathoracic growths.

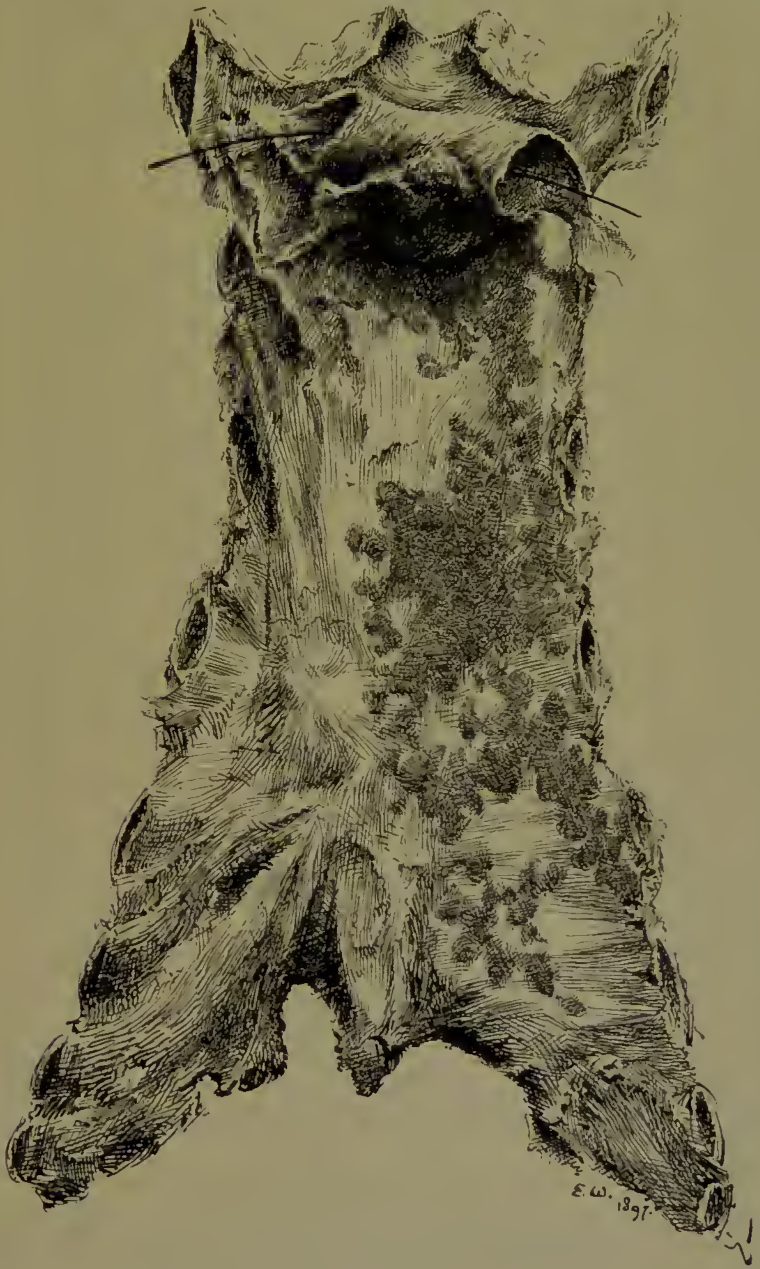

Fig. 54.—The posterior surface of the sternum, in a case of recurrent cancer with œdema of the arm.

Removal of the Breast in Diabetes.—The presence of sugar in the water in large quantities should, generally speaking, negative all but very needful operations in surgery. The breast was removed at St. George's twice in a period of thirty-five years in cases of glycosuria. Both the patients recovered well. I have myself once operated on a similar case, and the patient recovered easily.

At a meeting of the New York Academy of Medicine, 11th May 1896, Fisk presented a woman, sixty-one years of age, who had had a large percentage of sugar in the urine at the time he had removed one breast for an ulcerating carcinoma. She made a good recovery, and there had been absolutely no return of the carcinoma, but an examination of the urine to-day showed 2 per cent of sugar.

A speaker said that he had amputated the breast of a young woman having sugar in her urine, but the glycosuria had persisted after the operation. He had seen several cases of amputation of the thigh for diabetic gangrene, in which there had been a prompt and complete disappearance of the sugar from the urine.

A charwoman, aged sixty-two, was admitted into St. George's Hospital in August 1893. She had, two years before, been a patient for diabetes, and had been dieted for that disorder ever since. She had noticed a tumour in the right breast for three months, which had grown rapidly. The tumour was large, hard, and irregular, but the nipple and skin were not affected. The breast was removed, and in five or six days the wound had soundly healed.

In cases of glycosuria extra pains must be taken to avoid sepsis. If this be done, the sugar in the urine is no bar to a needful operation, though it must of necessity make the prognosis more serious, and this must be especially stated.

The following is a good example of the temporary good results that can be obtained, even in exceedingly bad cases, by free removal of a large mass of carcinoma threatening to fungate. It illustrates that operation upon such cases is justifiable, rather to prevent suffering, than from any hope of eradicating the disease.

An enormously stout single woman, aged sixty-one, was sent to me by Dr. Shann of Lowestoft, in January 1897. She was bloated, "short-winded," and "puffy," but the urine contained no albumen or sugar, and the heart sounds though distant were clear. The right breast was a huge mass of carcinoma, the skin being extensively affected, red and erythematous. Cancerous glands could be felt in the axilla. A consultation was held, and operation was advised merely to avoid fungation of the mass of cancer as large as a man's head, into which the breast was converted. The operation was therefore performed, the pectorals being very freely removed, and the knife sweeping round the base of the disease, leaving an extensive wound quite as large as a soup-plate. The integuments were freely detached below, and much of the wound could be brought together, leaving an irregular gap the size of a saucer. On this several "tags" or flaps of skin were laid down. Careful asepsis was maintained. All went well until the tenth day, when a little sepsis occurred as evidenced by a rise of temperature and some delirium and mild mania. This subsided under free stimulation and flushing of the wound with mercurial solutions. Skin grafting was afterwards carried out, and by the beginning of March the extensive wound had entirely healed. There was no sign of local recurrence six months after, the patient experiencing great temporary relief.

After-dangers and Complications.—Removal of the breast is a very safe procedure. Mr. Nelson Dobson,[1] writing in 1889, had sixty-three operations for scirrhus of the breast without a fatality. Many of those were done without strict asepsis. Some of the more extensive operations, as those of Halstead, or such methods as removal of the arm and scapula, or sawing through the clavicle, must of necessity increase the risk. The result of Halstead's cases, however, show us conclusively how good operating, combined with strict asepsis, may neutralise the supposed greater danger from extent of cut surface. The skill and care of the operator must be taken into account. It seems impossible at present to reduce the actual risk of all these extensive operations to statistics. Rapidity and certainty of operating, immediate arrest of hæmorrhage by pressure forceps, strict attention to asepsis, these conditions will render possible the safe performance of very extensive operations. In my judgment such proceedings should only be undertaken by those well skilled in operative surgery.

R. Williams[2] points out that in 472 non-antiseptic operations of Velpeau and Billroth the mortality was over 17 per cent. In 231 antiseptic operations from the practice of Volkmann, Lister, and Billroth, the mortality was only 6 per cent—a striking contrast. The causes of death in 14 fatal cases were septicæmia in 4, erysipelas in 3, shock in 3, exhaustion in 2, hæmorrhage in 1, anthrax 1.[1] At four London hospitals 489 mammary extirpations were performed for cancer with some form of antiseptic treatment. The mortality was only 9·4 per cent. Of the 46 fatal cases 63 per cent were due to sepsis. Erysipelas is the common malady, and Williams estimates that it is very deadly, for he found 20 cases ending fatally out of 40 that had been attacked.

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[1] *Bristol Med. Chir. Review*, vol. vii. p. 241.

[2] *Diseases of the Breast*, pp. 360, 361, 362.

In looking over the results of the earlier operations at St. George's Hospital, in the sixties and seventies, I may remark that none of them seem to have been "incomplete." Indeed great completeness was aimed at, and extensive removal of the glands was in several instances carried out. Among the series are several instances of extensive removal of recurrent disease. In a few of the later cases, it was noticed that the instruments were washed in carbolised lotion, or that carbolised oil was used in the dressing, but in none of them were anything like strict aseptic precautions employed. Moreover, the references to abundant discharge, and the coming away of ligatures, is sufficient evidence as to what would now be termed "sepsis." I was greatly surprised at the frequency of "union by first intention," and the number of deaths of 50 non-antiseptic cases were 6 in number, of these 1 was due to the uncontrolled action of caustics opening the pleural cavity, the remaining 5 were all due to "erysipelas" or "pyemia." This would make a mortality of about 10 per cent, selecting cases obviously not done with aseptic precautions.

In the years 1880-1884, when I was closely associated with Sir George Humphry's practice, that surgeon, by the use of "lint-stuffing," deliberately excited suppuration in cases of removal of the breast, as he believed the process tended to retard or prevent recurrence. This is in close accord with the practice of Gross, who used the actual cautery freely to the bases of his wounds. Out of 25 cases thus treated by Humphry, there was only 1 fatality, from erysipelas and concomitant acute pyæmia, in a private patient. Several of the patients, however, had erysipelas and were dangerously ill.

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[1] Anthrax has been attributed to infected catgut ligatures prepared from the intestines of animals affected with the disease.

The causes of death mentioned by Williams exemplify what is generally known regarding extensive operations, that the majority are due to septic complications, which should now be quite preventable. In the two cases lost by Jones (*Lancet*, 31st August 1895), one was due to bronchitis and dilated heart, the other to septic absorption from a granulating wound in the chest wall.

A most important account of the causes of death in 110 cases of operation for cancer of the mamma, where the patient died soon after the operation is as follows. Eight cases are recorded, four of erysipelas, one of pneumonia, one of brain metastasis, one of pulmonary embolism, one of œdema of cancerous lungs, liver, spleen, omentum. In the case of metastasis the operation hardly accounts for the result.[1] An exceptional cause of death is pulmonary embolism. A case is placed on record, however, where a patient suffered from femoral thrombosis after removal of the breast. A portion of clot being detached, the phenomena of pulmonary embolism with a fatal result ensued.[2]

Tetanus is not unknown after removal of the breast. I have fortunately never seen a case of this rare complication, and not one is recorded at St. George's in the Registrar's notes since 1865. Butlin refers to this exceptional condition in his *Operative Surgery of Malignant Disease* (p. 370). A case is also related by Hargrave.[3] Here the disease set in ten days after operation and proved rapidly fatal.

Mr. Augustin Pritchard[4] relates a death from tetanus after removal of the breast. "The wound healed chiefly by the first intention, and there was promise of a speedy convalescence, when one day the patient told me she had taken cold and had pain in the face. The next day the muscles of the face were stiff and hard, and there was unmistakable "risus sardonicus" and pain in the abdominal muscles. "These symptoms developed rapidly into tetanus of a most violent kind, with opisthotonos, and all the other signs, as severe in this delicate lady as ever I saw in the case of a strong man at the infirmary." The patient soon died, and Mr. Pritchard noted "that she had various small melanotic tumours about her body." He remarks that he had never heard of a similar case.

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[1] Lücké quoted by Halstead. *Annals of Surgery*, 1894, vol. xx. p. 553.

[2] *Middlesex Hospital Reports*, 1878, p. 116.

[3] *Dublin Medical Press and Circular*, 27th March 1867, p. 290.

[4] *British Med. Journ.* 1858, p. 169.

It may be mentioned that there is a specimen of scirrhous cancer in the Museum of the Royal College of Surgeons in Edinburgh. The patient from which it is removed is stated to have died of tetanus eleven days after operation.

All surgeons of experience know that sometimes patients die after extensive operations in a sudden and inexplicable manner. Some such cases are due to cardiac failure from profound sepsis, others to pulmonary embolism. In others again, even post-mortem examination fails to explain the cause of death. Were a careful bacteriological examination made of the tissues, much might be explained of these very mysterious cases.

A single woman, aged sixty, was operated upon in St. George's Hospital in May 1872, for a large carcinoma of the left breast. The operation was performed on 30th May. The temperature on the 31st was 101° and there was some pain about the wound. During the night she had considerable dyspnœa, and on the morning of 1st June, after awaking, she quite suddenly died. No autopsy was permitted. But from the temperature one would expect death to be due to sepsis and cardiac failure. In those days, bacteriological examination was of course never made.

Mania after Breast Operations.—Mr. S. Paget, in a private communication, has kindly sent me notes of a typical case of this nature.

"A very neurotic, feeble-minded, emaciated patient. Did well after operation, but then very slowly failed to recover health of body or of mind; refused food, and had to be patiently brought back under Weir Mitchell's treatment; but she relapsed into a state of melancholy, just picking at her food, with fits of crying and general feebleness. She went to Florence for the winter (two and a half or three years, I think, after operation), and there had delusions, became violent, and is now hopelessly insane."

Mr. Paget also sends accounts of several other cases, but it is not clear how far one of these was due to acute sepsis, and the other to alcoholism.

In February 1896 I operated at St. George's Hospital upon a feeble woman, aged sixty-four, for scirrhus of the breast. The case did perfectly well, but on the fifth day the patient had delusions of a mild nature, with a tendency to pick at the dressings and get out of bed and talk wildly. These symptoms passed away under a generous diet, stimulants, and an occasional dose of bromide of ammonium. The symptoms, however, lasted for four nights and occasioned some anxiety. A similar case occurred in my practice in 1897. Here the patient had delusions, and refused food for nearly a week. She recovered perfectly.

A most interesting communication was made to me on this subject by Mr. Pridgin Teale of Leeds. I have his permission to state that he encountered four cases of acute mania after amputation of the breast; these were closely associated in the point of time in his practice when he used iodoform, none having occurred before or since.

He raised the idea that this distressing complication was possibly brought about by iodoform poisoning, and this may lead surgeons to be cautious how they scatter this agent over a large fresh breast wound.

On the 14th May 1896 I operated upon a lady who had been under the care and supervision of a specialist in lunacy matters for five years. She was nearly sixty years old, and for some six years had been queer in manner, addicted to living apart from her relatives, and remaining dirty and obscure, lurking in bed all day, and only going out at nights. She was also an inveterate smoker, but thin and spare, and excepting for slight bronchitis had no visceral disease.

The operation was for a growth of the nature of "duct carcinoma"; it was performed with the most careful aseptic precautions, and Dr. Hewitt administered gas and ether as the anæsthetic. The whole breast, pectoral fascia, and axillary glands were removed. The day following the operation the patient had slept well, and her temperature had not risen above the normal. She took her nourishment and gave no trouble, excepting that there was a marked tendency to laughter and merriment, such as is very unusual in persons after a severe and distressing operation. Her case did perfectly well, but she apparently suffered from curious dreams, which she related in the mornings. "A gardener had been planting rose-trees all the night in the room." "She had been photographed with the X-rays"!

The tendency to undue cheerfulness and joking was very marked. The patient "got up" within a week, and her recovery was excellent.

Delirium Tremens.—I have already spoken of the importance of detecting and correcting intemperance before operating on carcinoma of the breast. Mr. Paget sends me notes of the following two cases bearing forcibly upon this most important point.

(1) A very excitable patient, suspected of being too much given to alcohol. After removal of breast she became violently excited, screaming and fighting for hours: a doctor gave her morphia; she slowly sank and died only sixteen hours after operation.

(2) A patient, syphilitic and a drunkard. After removal of the breast, same train of symptoms occurred and death at the end of fifty hours. P.M., extensive secondary disease of liver.

As regards the treatment of these very distressing cases, I would only draw attention to the perils of morphia, if the kidneys, as is too likely, are diseased and incompetent, and chronic bronchitis should co-exist. My favourite prescription is a mixture of ten grains each of the bromides of ammonium, sodium, and potassium, in five ounces of the best porter. This mixture is readily taken by such patients, and usually proves beneficial.

On the other hand, alcoholism must be no absolute bar to operation in these cases, and if great care be taken all may go well, as in the following instance.

On 29th January 1896 I operated upon a lady, aged forty-seven, who for ten years had been very intemperate, drinking principally beer and spirits. It was impossible to picture a worse subject for an extensive operation. She was very fat, bloated, and tremulous, given to morning sickness, fits of depression, and crying. The heart's action was feeble; the lungs were emphysematous. She passed a large quantity of urine of a low specific gravity. For fourteen days prior to operation this lady was placed in charge of a nurse, and only allowed a little claret once a day. She had two grains of blue-pill every night, with purgative waters in the morning. The skin of the breast and axilla was most carefully purified, and the operation was a very extensive one, the axilla being much affected. An enormous wound was left, but this, by the aid of careful drainage and accurate apposition, united rapidly, without trouble or fever. On the fourteenth day the sutures were removed and the wound was found healed. The "bromide and porter" mixture was occasionally administered at nights, if pain and sleeplessness seemed prominent symptoms.

Removal of the breast in drunken or mentally weak patients is not therefore always followed by harmful consequences. Such patients should, as far as possible, be kept in a sitting posture, against pillows, and not be allowed to maintain the dorsal position.

Should bronchitis or pneumonia unfortunately supervene, the treatment must be conducted on ordinary medical principles, and such drugs as carbonate of ammonia and strychnia will be especially valuable. The indications of treatment should certainly incline towards free stimulation.

Mania and delirium are found after many severe operations, and I can find no evidence that they are especially to be feared after operations on the mamma.

Chemical Erythema.—The use of powerful chemicals, especially carbolic acid, will induce in some skins an appearance very similar to erysipelas. Indeed the similarity is quite deceptive. In the cases I have seen there has been no fever or rigors, the tongue has remained clean, and on two occasions I have had cultures made of the dressings, and scrapings of the skin, with the result that nothing in the nature of pyogenic organisms were found.

In July 1895 I operated upon a hospital patient, aged sixty-one, sent me by Dr. Ridge Jones, for carcinoma of the breast. She was a fat woman, but healthy and well. There was no renal inadequacy, cardiac or visceral disease. The operation was performed with customary antiseptic precautions, and presented nothing peculiar. The dressing was the best cyanide gauze, soaked in carbolic lotion (1 in 40). All the applications were obtained from reliable makers. A little iodoform was used to the margins of the wound. At the first dressing the appearances were quite alarming; a deep red blush exactly like that of erysipelas spread over the entire chest, but its margin was strictly limited and corresponded exactly with the extent of the dressing. The patient was quite comfortable, and the temperature was below 100. The skin of the arm, where it had lain in contact with the sublimate wool, was also red and inflamed. A cultivation made from the breast wound was sterile. The dressings were continued, the gauze was wrung out of 1 in 80 carbolic lotion, and a sheet of "green protective" smeared with ung. borici was laid over the part. The blush on the skin, obviously the result of irritation, subsided spontaneously.

Removal of the Breast during Pregnancy—Risks of Abortion or Premature Labour.—Some of the most anxious cases the surgeon will have to confront will fall under this category. Commonly during pregnancy or lactation carcinoma of the breast increases with the most frightful rapidity, so that removal is urgently needful. The question of induction of premature labour before operation, or its occurrence after, is always an anxious one. In the later months of pregnancy premature labour is often followed by a spurious attempt at lactation, whereby the vascularity of the breasts is notably increased. As a general rule, it is well to operate without regard to the pregnancy. It does not follow that premature labour will result. Should this unfortunately happen, very elaborate care should be taken to keep the maternal passages in an aseptic condition, and the patient's strength must be well maintained. It is right to point out that the association of pregnancy with carcinoma is a peculiarly unfavourable one, and the risks of the operation must be somewhat increased, as shown by the following case.

A married woman, aged thirty-six, was admitted into St. George's Hospital on 8th September 1895. She had noticed a small hard lump in the left breast for twelve months; there had been an occasional bloody discharge from the nipple. She was five and a half months advanced in pregnancy. The growth, which was hard, lobulated, and of uncertain nature, occupied the greater part of the breast. At a consultation removal was advised, as the tumour was rapidly increasing; the obstetrical physician concurred. This was done on the 24th. The patient did not do well after the operation. On the 28th the temperature was 103, and she complained of pains like "spasms" about the breast. On the 30th she miscarried, an eight months' child being born, which did not long survive. She died on the 1st October with high fever and vomiting. The breast wound was looking very well, and there were no signs of sepsis about it.

In February 1896 a woman aged thirty-five was in St. George's Hospital under Mr. Pick's care. She was in the eighth month of pregnancy, and the right breast was converted into a huge mass of livid and fungating carcinoma. In the operation a large area of skin was removed, and the axilla was so involved that a portion of the axillary vein had to be removed. The woman did not come in labour prematurely, and the wound healed well. She had no constitutional disturbance or fever. A large raw surface was left by the operation, and this was being grafted, and when last seen was skinning over rapidly. Within a month of the operation the woman was going home to be confined in the usual manner. Recurrence unfortunately soon took place.[1]

Mr. Mayo Robson has had an equally favourable case.

Mrs. S. was operated on in 1887 in the infirmary for a rapidly growing cancer of the breast involving the axillary glands, a complete and radical operation being done. Recovery occurred without fever or complication, and the patient went to the full period of her pregnancy. When heard of a year afterwards there had been no return of the disease.[2]

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[1] No. 234 in Hosp. Register.

[2] *Brit. Med. Journ.* 11th April 1896.

Two cases are related by the late Sir William Savory which illustrate that pregnancy need form no bar to operations on the breast. In one case, a woman aged thirty-seven had the breast removed for a large sarcoma. She was four months pregnant. In the other, a patient seven months pregnant had the mamma removed for scirrhous cancer. Both the cases made a rapid recovery. Matthews Duncan was consulted as to the propriety of inducing premature labour in the first case, but he did not advise it.

Even if the patient should survive the operation the prognosis as to recurrence is exceedingly bad. Thus Bryant[1] relates five cases of cancer of the breast associated with pregnancy, which apparently from their rapid extent were too advanced for operation, and in which death rapidly supervened.

Hæmophilia.—I have never been asked to amputate the mamma in this condition, so rare in females. In a marked "bleeder," where hæmorrhages occur from the rectum or other mucous surfaces, I should decline operation as being exceedingly dangerous.

Death from the entrance of air into a wounded axillary vein was not unknown in the pre-anæsthetic days. The late Mr. Gay of the Great Northern Hospital is related to have met with this complication, and constantly impressed his assistants with his great apprehension of it.

It would hardly be likely to occur now with our modern careful operating. A graphic description of this terrible accident is given by Warren.[2] The patient was a woman aged thirty-three, and she was placed sitting in a chair to have the breast and malignant axillary glands removed. Towards the end of the operation a large vein was wounded, and a bubbling or gurgling noise was heard. The patient became insensible, "breathing as though in an apoplexy." She subsequently died despite all restorative measures.

A case of this mishap is, however, related by Mr. Hall at a meeting of the Bradford Medico-Chirurgical Society for 11th January 1898. The air was heard to enter the vein. The patient became pallid, ceased to breathe, and to all appearances was dead. With artificial respiration and injection of strychnia she slowly recovered.

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[1] *Diseases of the Breast*, pp. 153, 154.

[2] *Surgical Observations on Tumours*, p. 260.

Keloid.—The scar of the wounds made by removal of the breast sometimes becomes reddened and greatly thickened. I have known this appearance, which is really keloid in nature, mistaken for recurrence of growth. Small red nodules also appear in the sites of the "stitch apertures," and their appearance is exactly like recurrent cancer, for which they have often been mistaken. It is curious how often a certain amount of keloid change occurs about the scars of mammary operations, not only for removal of the entire breast, but also after the extirpation of fibro-adenomatous tumours, or the opening of abscesses. Sometimes the growth is excessive, and serious alarm at the supposed return of the tumour is readily created. When once the diagnosis of keloid is clear, no operative treatment should be attempted. Soothing applications and pressure may be adopted, with the occasional use of the ice-bag.

It is a difficult matter to present to the reader a trustworthy statement regarding the ultimate results of operations for cancer of the breast. Much depends not only upon the type of operation, but the nature of the growth and upon the thoroughness and care of the operator. Much hangs upon the kind of case, and the extent of implication of adjacent lymphoid structures, skin, fascia, or muscle. One thing is certain, that the results of operations in the earlier years of this century were essentially bad, yet perhaps not so bad as is generally believed. The pessimistic views held by Sir J. Paget were well known when he stated that in ordinary typical cancer of the breast the instances in which it did not occur were not more than 1 in 500.[1]

Such surgeons as Cline, Everard Home, and before them, Monroe, would hardly consent to its performance. Brodie is much against the operation, except in a few selected cases where the local conditions are obviously of the most favourable description.[2] Halstead states that Agnew operated in America for "moral effect," and Sands did not save a single case.[3]

Velpeau, whose experience was perhaps larger than any surgeon of his day, speaks in no uncertain tone regarding the result of operations for cancer of the breast. After operation, "there always remains the sad prospect of a return of the disease when the operation has been had recourse to in the case of genuine cancer."[1] Velpeau saw no argument in the return of cancer to prove that it was a constitutional malady, and he shared the now prevalent opinion that local recurrence was due to imperfect removal.

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[1] *Path. Soc. Trans.* vol. xxv. p. 321.

[2] *Works*, vol. iii. pp. 256, 270.

[3] *Annals of Surgery*, vol. xx. 1894.

This surgeon employs the term "cure," but it is difficult to ascertain exactly what he means by it, and it seems as though he employed it synonymously with recovery from operation. One might quote one author after another, and the results of one surgeon after another, and the same conclusion would be arrived at, that the results of operation in the breast as regards recurrence were essentially bad, and that anything like genuine cure—*i.e.* permanent eradication of the disease—was exceedingly exceptional.

The explanation of these bad results is easy to offer. At the beginning of this century there was a kind of reaction against the old and barbarous practice of sweeping off the entire mamma with a knife, and applying caustics and the cautery. Had such operations been done in early cases of carcinoma the results would probably have been good so far as regards local recurrence. As may be imagined, patients never submitted to them unless driven by the tortures of the disease in an advanced condition. Next followed anxiety to obtain speedy union. This led the surgeons into quite the opposite extreme, and the flaps were brought together with masses of cancer actually shut up in the wound, the disease being really never removed. This state of things was brought prominently forward in the remarkable paper by Charles Moore of the Middlesex Hospital, already referred to. In Moore's paper is quoted one case when nine years of immunity occurred after an "incomplete" operation, and he truly says that with such a result an operation can hardly be termed "inadequate." This and similar statements in literature have made me doubt whether the results of the old method of operating were so universally bad as is generally thought to be the case. Surgeons who take their results from hospital sources entirely, are apt to have a faulty impression of these matters. The cases in which the disease recurs often reappear; those who remain well, disappear and are not traced. I was surprised to find from the records of the private practice of various surgeons, how many cases could really be found where freedom for periods like three, five, or six years could be traced. Some indeed remained well for longer periods, and many of the most striking cases observed of prolongation of life, were those where local recurrences had been repeatedly removed. All the operations would now, by the school of surgeons who advocate removal of the pectorals, be considered "incomplete."[1] In a paper on latency and immunity[2] after operations on cancer of the breast, brought before the Medico-Chirurgical Society of London in 1898, the following results were noted:—

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[1] *Diseases of the Breast*, p. 563.

Out of 44 cases when the disease did not recur, or the patients died of other causes, the periods were as follows:—

From 6 to 12 years	23 cases
12 to 20 ,,	16 ,,
20 years and over	5 ,,
	44 cases

Out of 48 cases where recurrences were long delayed, recurrence took place from the fourth to the eighth year in 19 cases.

In the 9th year	8 cases
10th ,,	9 ,,
11th ,,	2 ,,
12th ,,	1 ,,
13th ,,	1 ,,
16th ,,	1 ,,
17th ,,	1 ,,
19th ,,	1 ,,
22nd ,,	2 ,,
23rd ,,	1 ,,
25th ,,	2 ,,
	29 cases

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[1] Microscopical proof of cancer was not forthcoming in all these cases; but the utmost pains were taken to be certain that the clinical and microscopical appearances were undoubted. The names of the surgeons who report the cases are strong evidence of their genuine nature.

[2] Immunity is taken to mean "freedom from."

In 15 remaining cases recurrence took place early, yet after removals often repeated the most remarkable periods of prolongation of life appeared. Prominent among these are the following:—

A case communicated by Mr. Edmund Owen of St. Mary's Hospital, where a woman, aged fifty, had the breast and some enlarged axillary glands removed in 1876. The tumour was undoubtedly cancerous, had existed for seventeen months, and had been treated with injections of acetic acid. Local recurrence took place in 1877, in 1878, and in 1879; the nodules were in the region of the scar, and always freely removed. In 1896, twenty years after the first operation, this patient was alive and well.

A lady had a cancerous tumour excised by Birkett from the upper margin of the right mamma in 1878. She remained well for ten years. Then the growth recurred, and the whole breast was removed by Durham. Recurrence took place in the scar or near it every year until 1894, when two recurrences were removed. In 1895 Mr. Marsh operated, and in 1896 an eminent provincial surgeon. This patient has had at least twelve local operations, and is in 1898 in good health at the age of seventy-two. The facts of this case, which are undoubted, were communicated to me by Dr. Hare of London, and Mr. Marsh.

A lady, aged twenty-eight, had a tumour of the right breast removed in 1837. In 1838 it returned and the whole breast was removed. In 1839 repeated removals were done by Brodie and Travers. The description of "tubers," bleeding masses, etc., is very suggestive of carcinoma. In 1842, recurrence again taking place, she underwent very severe caustic treatment by M. Canquoin in Paris. In 1843 sound healing occurred. This lady died in 1892, at the age of eighty-two, of cardiac failure. She had been free from breast disease for forty-nine years. Her daughter died of carcinoma of the mamma just after her mother's decease. The facts of this case were communicated by Dr. Cullingworth and the son-in-law of the patient, who is a medical man.[1]

The following cases observed at St. George's Hospital well illustrate what is common, the extraordinary latency of cancer in operations which are "incomplete," so far as removal of the axillary glands is concerned.

A woman, aged forty-six, had her left breast removed for "scirrhus" in 1878. In 1883 she was admitted into St. George's Hospital suffering from recurrent disease, under the care of the late Mr. Rouse. She had been quite well for five years, when a "lump" began to form under the left arm, and she had great abdominal discomfort and trouble. There was recurrent cancer in the left axillary glands and a large mass of cancerous growth in the right breast. It is worthy of mention that the patient was quite ignorant of the presence of disease of the right breast. No operation was performed and she shortly died.

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[1] Other equally extraordinary cases were referred to at the debate at the Med. Chir. Soc. in 1898. Thus Sir T. Smith referred to a case of return in the axillary glands twenty-four years after the operation. Mr. Hutchinson referred to a return twenty years after. Other speakers quoted many remarkable examples.

In December 1876, Mr. Pollock removed the left breast of a patient for scirrhus. She remained well until 1881, a period of five years. Then a "lump" appeared above the clavicle, and she was again admitted in November 1882. The mass of disease above the clavicle, and below it, was so large and fixed, that no further operation was performed.

A married woman, aged sixty-five, was operated upon in St. George's Hospital in 1873, and the right breast was amputated for undoubted scirrhous cancer. She remained quite well for seven years, and then an ulcerating nodule began to sprout in the scar. Finally the whole integument of the thorax became thickened and infiltrated with cancer and she died. No further operation was attempted.

The case is interesting to show that even in the incomplete operations performed as long ago as 1873, when such structures as the pectoral fascia and outlying lobules of mammary tissue were generally left, freedom from disease for over three years, the modern "cure," was not unknown.

A reference to the author's paper,[1] and a perusal of the cases, will make it clear that extraordinary exceptions occur to the rule, that recurrence and death follow removals of the mamma for cancer, by methods now termed incomplete. Of cases free for three to five years quite a number could be collected. Sir James Paget's unfavourable views have been referred to. Kindly writing to the author in 1896, he speaks as follows:—"Writing from recollection, I should say that survivals of three years—such as are now often called "cures"—were not very rare; but I can remember very few who survived without recurrence more than five years—of those who survived more than ten years there were only two or three known to me—certainly less than 1 per cent."

A general consideration makes it clear that in certain exceptional cases, though the removal has been what is now considered incomplete, very long freedom from return has been observed, or recurrences have been local only. It is to be regretted that I am not in a position to offer explanations of such interesting examples. Either there is something in the host in these cases inimical to the growth of cancer, or there is something in the nature of the growth which tends to slowness of return or retrogression. At all events I have a strong impression that the results of the so-called "incomplete" operation are not so bad as generally believed, and a perusal of Sir T. Smith's cases, reported in the *Lancet* for 1896, are worthy of the most close attention in this respect. Treves, writing as late as 1891,[1] plainly gives the choice to the minor operation, and does not see that clearance of the axilla in all cases is at all needful. In 1897, I have reason to believe that this opinion has been somewhat modified, and that this surgeon removes the axillary lymphatics in one piece with the breast.

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[1] "Latency and Freedom from Recurrence after Operations for Cancer of the Mamma," *Med. Chir. Soc.* February 1898.

Taking into consideration the occasional good results that have followed the lesser operation, peculiarities in the growth or the patient cannot be ignored, in estimating the boasted results of the modern extreme operation. I distinctly wish it to be understood, however, that I hold no brief for imperfect operating.

Fresh manifestations of the disease locally, or in the bones or viscera, may occur at any period up to ten or fifteen years after the original operation. These may be termed "fresh outbreaks" of disease, or what name any pathologist fancies, but the fact remains that the word "cure" will be used with great caution by any one who views the matter from the light of plain common sense, and a desire to act truthfully and honestly towards patients.[2]

Ardent advocates of very extensive operations have hardly yet had time to consider their position. Cancer cases need watching for many years before pronouncing a verdict. How many patients survive the three years' limit and then die of visceral cancer, is at present quite uncertain.

No cases are so obscure as instances of recurrent cancer in the bones and viscera. Medical certificates are not always accurate, and post-mortem examinations in such cases are comparatively seldom obtained. When the advocates for the complete operation are able to bring forward a large series of cases where, after amputation of the mamma for carcinoma, the patients have survived free from cancer for ten years or upwards, and those who have died during this period have been proved pathologically to have their tissues free from cancer, then, and not until then, are we in a position to judge of the truths of conditions like the cure of cancer by operation. Long freedom from return of the disease is a different matter, and this we may promise to our patients, with perfect confidence, in a large number of cases if they are brought to us early, and especially if the cancer be of a chronic nature.

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[1] *Operative Surgery.*

[2] I am glad to find that no mean authority, Jacobson, casts doubt on the propriety of using the term "cure" to cases which have passed the three years' limit. He considers that six years at least should elapse (*Operations of Surgery*, 3rd edition).

Passing on to quote the results of authorities, Bryant[1] analyses the duration of life in 72 cases. After operation 55 per cent died within three years, 44 per cent lived over three years. He tells us that the results are practically the same as exemplified in Paget's well-known tables of 61 cases not submitted to operation. But then he well points out that of his (Bryant's) cases 18 out of the 72 lived from five to ten years. Thus while one-half of the patients die within three years, any individual patient may live from five to ten years.

The indication given by these and similar tables, is to carefully study and recognise the clinical features presented by cases of carcinoma, in which such long freedom from recurrence is observed.

Gross[2] finds that in unoperated cases, 97 in number, the average duration of life was 27·1 months. He compares with this the statements of Oldekorp, Henry, and Winniwarter, as 22·6 months, 26 months, and 32·9 months.

R. Williams,[3] a most indefatigable collector of statistical details, gives the result of 47 cases submitted to operation. Four recurred under three months, eight under six months. No less than six cases were free from recurrence for over two years, and ten for over three years.[4]

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[1] *Diseases of the Breast*, p. 152.

[2] *Tumours of Mammary Gland*, p. 163.

[3] *Diseases of the Breast*, p. 365.

[4] *Op. cit.* p. 366.

After very thoroughly discussing the results of operators in this country and Germany, this author makes the very striking and important statement that complete cure after thorough operations for cancer of the breast may be expected in at least 15 per cent of all cases. The same author estimates from tables compiled at the Middlesex Hospital, that the average duration of life for the operated cases was sixteen months more than for the non-operated.[1] The estimation of Williams as to complete cure is modest when compared with the results claimed by some operators, but is probably nearer the truth.

The following from his work on diseases of the breast[2] may also here be quoted.

"Of 1234 operated cases of mammary cancer collected by Gross, 146 (11·83 per cent) resulted in radical cure; while Kœnig, Küster, Gross, Banks, Estlander, and Gussenbauer estimate the cures in their latest series of similar operations respectively at 22·5, 21·5, 21, 20·35, 20, and 16·7 per cent."

Here the term "radical cure," I presume, is taken to mean freedom from disease for over three years. I have already objected to this time limit as being too short.

William T. Bull of New York, in an important article in the *Medical Record* for 25th August 1894, records his observations in 118 cases where carcinoma of the breast had been treated by the radical operation. The principles of his operation are the making of a wide oval incision reaching from the sternum to the axilla; the whole gland, the pectoral fascia, and the axillary glands and connective tissue are removed in one mass.

Bull, like many other authors, regards a three years' limit as evidence of "cure," and of the cases he carefully traced he finds evidence of "cure" in the gratifying proportion of 20 out of 75. Of his cases, 4 died of other diseases after passing the "three-year limit"; 16 cases lived free from recurrence on an average six years and a few days; 4 of them lived upwards of ten years. These results are peculiarly valuable as showing what may be fairly expected from a "complete" operation for cancer of the breast.

In cases submitted to operation, Gross[3] finds that out of 224 cases the average duration of life was thirty-nine months. Gross is of opinion that operation adds twelve months to the life of the patient. He estimates also that cure, *i.e.* survival over three years, is met with in 9·05 per cent of all cases. These estimates are especially valuable, for his method of operating, namely, free removal of the breast, skin, and infected glands, was well known, and he concludes that the more favourable results he is able to quote are largely due to his completeness in operating. The cases were not selected, and axillary infection had occurred in many of them, necessitating removal of the contents of that cavity. He sums up his observations, founded on operation upon 519 cases, by calling attention to the fact that nearly one-third were free from recurrence after the lapse of three years, while of 67 cases who were not operated upon only 1 survived that period.[1] Thorough operations cure about 9·05 per cent, and the patient is safe from reproduction if three years have elapsed since the operation.

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[1] *Diseases of the Breast*, p. 366.

[2] P. 264.

[3] *Tumours of the Breast*, p. 164.

The ultimate conclusions of Gross, based on his own experience and an analysis of the results of Oldekorp and others, may here be quoted. Carcinoma of the breast is inevitably fatal if left to itself.[2] About 1 in 6 die of the (radical) operation, but the risk is worth taking, as it adds twelve months to the life of the patient. The thorough operation cures 9·05 per cent of all patients, and recurrence may be delayed or prevented altogether by clearing out the axilla at the same time the entire breast is removed. On page 234 this author plainly asserts that he considers antiseptics needless in amputations of the breast, and hence the high mortality of the "thorough" operation in his hands may be to a large extent explained. These results will bear interesting comparison with Halstead's. This operator did not lose one out of his 50 cases from the immediate effects of the very extensive operations he advocates. Halstead claims that he gets local recurrence after his "thorough" operation in only 6 per cent. Keen, in the *Cleveland Medical Gazette* for December 1894, holds that we are now justified in giving a far more favourable prognosis in carcinoma of the breast than was formerly the case. The death-rate in America, dealing with 464 cases treated by four or five surgeons, was only 0·86 per cent. He states that if a woman escapes recurrence for over three years she is safe.

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[1] *Op. cit.* p. 165.

[2] This statement is too absolute, as may be seen on perusing cases of atrophic cancer on p. 335.

Jamain and Terrier[1] thus speak of the important subject of recurrence. It is most frequent from the second to the seventh month: 382 cases were observed by these authorities against 156 before the end of the first month; 150 were observed during the course of the seventh and thirteenth months; 82 in the course of the second year, 25 in the course of the third year, and 26 after three years had passed.

Wright[2] gives the result of 17 cases as follows:—

Number of cases alive and well under 10 years of operation	6
" " 3 "	5
" " after 3 "	6
Died from operation	0
	17

The "complete" method with removal of the pectoral fascia and glands was carried out in these cases.

Dr. Keser, of Harley Street, in a private communication in January 1895, informs me that he carefully followed 66 cases of scirrhus of the breast operated on at Bâle by the late Professor Socin. The mortality was 7·6 per cent. Dr. Keser traced 57 of the cases, and found 5 in good health and free from recurrence five to thirteen years after the first operation. All were early cases, and the diagnosis was confirmed microscopically. These cases were operated upon by the "old" method. The axilla was only opened when enlarged glands could be detected.

One of the latest contributions of value to the results of breast operations under the conditions of modern surgery will be found in the *Lancet* for 31st August 1895, by Mr. Thomas Jones and Mr. Platt of Manchester. Fifty-five cases were investigated, and the after-history of 52 of these was carefully followed up. There were two deaths, one from septic absorption, the other from bronchitis and dilated heart. The axilla was opened and affected glands removed in 47 of the cases. The rule followed, was to remove the entire breast, dissect off the pectoral fascia, and remove portions of the muscle completely, to examine the axilla through the wound, and if the glands be affected, to remove the breast and glands as one piece. Eight cases were living at the period of writing, with an average time since the operation of four years. The longest time was eleven years. Adopting Volkman's rule, that if a patient is free from recurrence three years after the operation she may be considered cured, the author is able to point to the fact that 12·5 per cent of his cases fulfil this condition.

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[1] *Manuel de Pathologie et de Clinique chirurgicales*, tome quatrième.

[2] *Annals of Surgery*, vol. xxii. 1893, p. 460.

Mr. Mitchell Banks at a meeting of the Harveian Society in March 1887 gives the following valuable summary of the results of free removal of the mamma and adjacent lymphatic glands out of 64 observed cases:—

17	cases were alive	and well for	3 years and upwards
5	,,	,,	3 to 4 years
3	,,	,,	4 to 5 ,,
3	,,	,,	5 to 6 ,,
2	,,	,,	6 years
2	,,	,,	8 ,,
1	,,	,,	12 ,,
1	,,	,,	13 ,,

Halstead's paper, too lengthy to quote here, and which should be carefully studied in full, is concluded by the following table, which I reproduce as showing the results of German surgeons in the last twenty years, and the marked diminution of local recurrences by extensive operating.

Operator.	Time.	No. of Cases.	Local Recurrence.
Bergmann . . .	1882–87	114	51–60 per cent
Billroth . . .	1867–76	170	82 per cent
Czerny	1877–86	102	62 ,,
Fischer	1871–78	147	75 ,,
Gussenbauer . .	1878–86	151	64 ,,
König	1875–85	152	58–62 per cent
Küster	1871–85	228	59·6 per cent
Lücke	1881–90	110	66 per cent
Volkman . . .	1874–78	131	60 ,,
Halstead . . .	1889–94	50	6 ,,

A survey of Halstead's 50 cases, as reported in the *Annals of Surgery* for 1894, show the following results:—

There died of metastatic deposits, internal or in the "region" of the wound, 10 cases. Most of these succumbed within three years of the operation. The cause of death was unknown, or the case lost sight of, in no less than 11 instances. These, therefore, are hardly available for argument. Nineteen cases are reported well under a period of two years, some of them, as will be shown, very considerably under this time. Five are reported well for over two but under three years. Two cases are reported well over three years. These would now be termed cures. One case was alive eleven months after operation with numerous skin metastases, and one with cancer of the femur, which seemed to have existed at the time of operation. Eight cases are reported at seven, four and a half, three, three and a half, three and a half, three, and two months after operation, and one at forty-six days. Cases reported at such early periods are hardly of much value.

Now these cases, reported with perfect sincerity, and operated upon by one of the most complete operations known, show us—

(1) That strictly local recurrences in the scar or glands are greatly reduced by this method.

(2) That deaths from metastatic deposits seem in no marked way influenced.

(3) That if the causes of death were ascertained in the 11 cases mentioned above, the proportions of deaths from metastasis might be increased.

(4) That many of the cases are reported at such early periods that little useful conclusions can be drawn from them.

Side by side with Halstead's valuable and instructive results, taking him as holding the brief for the complete operation, let us take Sir T. Smith's operations.[1] His cases are typical of what is called the incomplete operation, *i.e.* that the axillary fascia, pectoral fascia, and glands are not removed unless felt to be affected. Also it is noteworthy that these cases are related years after they have been operated upon, having been followed out to the end. Like Halstead's cases they may be looked upon as reliable and true records. Of 35 cases, local recurrences took place in 26, or nearly 74 per cent. Eight cases recurred within a year, 18 in all had recurred in three years, 8 cases recurred after three years.

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[1] *Lancet*, 8th August 1896.

Taking the three years' limit as now generally received, Mr. R. Smith points out that there were—

20 failures out of 35 cases ;
$= 57\frac{1}{7}$ per cent failures,
$= 42\frac{6}{7}$ per cent cures.

Taking the time without any limit—

29 failures out of 35 cases ;
$= 82\frac{6}{7}$ per cent failures,
$= 17\frac{1}{7}$ per cent cures.

Thus a very good case is made out for the incomplete or lesser operation, excepting that local recurrences are frequent. None of the cases died of the operation. The percentage of local recurrences is certainly high, but, strangely enough, some of the cases when life was longest preserved had the greater number of local recurrences removed. The operations were, of course, far less severe and far less alarming to the patient than those of Halstead. Six of the cases are remarkable, and may be thus presented: (1) Died of old age with no recurrence; (2) in good health thirteen years after; (3) in good health nine years after; (4) in good health four years after; (5) in good health thirteen years after; (6) in good health seventeen years after operation. In cases 2, 3, 4, 5, local recurrences were removed. Such results as these, though exceptional, are very striking, and go strongly to show that the nature of carcinoma cases is very diverse.

Now, on comparing together Halstead's and Sir T. Smith's results, an unbiassed observer would be apt to give the prize to the incomplete operation: Sir T. Smith's final results seem indeed better. The reason is not far to seek. Many of Halstead's cases were obviously desperately bad ones, such as could scarcely be dealt with by any operation. Yet, as has been pointed out, a number were reported too early to draw correct conclusions. Indeed, had it not been for the fact that Halstead is always spoken of as a typical example of the "complete" operator, I should not have quoted his results on account of the short time which had elapsed after many of his operations. His operation is founded on the researches of Heidenhain, and that he is able to prevent local recurrence by his methods is incontestable.

A most important statement regarding the result of operations on atrophic carcinoma is also given in the *Lancet* for 5th August 1896 from the practice of Sir T. Smith. In six cases of atrophic cancer in which operation (incomplete) was performed, "in percentages, $33\frac{1}{3}$ per cent have been cured; $33\frac{1}{3}$ per cent have died from the disease; and $33\frac{1}{3}$ per cent are alive with the disease advancing. These figures simply bear out what is already generally stated about the prolonged duration of life in these cases.

"Whether a more extensive operation would give better results it is difficult at present to say, because of the length of time that must be allowed to elapse after the operation before any fair conclusions can be drawn. One thing is certain, that to put such cases among a list of ordinary carcinomata, would lead to quite erroneous conclusions as to the average duration of life."

Nothing could demonstrate more strikingly than the above diverse results, how hopeless it is to get a correct estimate of the duration of life after operation for cancer of the breast by considering together a number of cases of all degrees of severity and extent. It is right also to point out that had Sir T. Smith operated upon all the cases of withering or atrophic cancer presented to him, he might have quoted more instances of long life after operation.

Nothing shows more completely the influence of very extensive operating in preventing local recurrences than the statistical details prepared by Cheyne.[1] He points out that when the principal German operators have had local recurrences to the extent of from 60 to 70 per cent the results of his own cases and those of Halstead have reduced this proportion to 18 and 20 per cent respectively. As regards freedom for over three years, termed "cures," he is able to point out that 12 out of his 21 cases fulfilled this condition, or 57 per cent, whereas Mitchell Banks, out of his 80 cases had but 18 "cures." Preferring, as I do, not to advocate this term in cases of cancer, it may nevertheless be pointed out that such statements warrant us in taking a far more favourable view of the results of operations for carcinoma of the mamma than has hitherto been customary.

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[1] Vol. xix. *Med. Soc. Trans.* Lond.

As regards the mortality results of very extensive operating, it will be seen from the results quoted that the danger from the actual operation, if performed with strict asepsis, is practically very little. A robust and sound patient will almost certainly recover from the most extensive operations. Nothing will induce me to believe, however, that operations involving long anæsthetisation and extensive incisions and dissection, do not involve corresponding peril to old, very obese, feeble, or bronchitic persons. It is hard to credit, moreover, that such operations are no graver than some of the minor performances of surgery, and the mere operative execution of such proceedings as dissecting away lymphoid tissue from the axillary vein are not devoid of operative risk.

Bennett May, in his Ingleby Lectures,[1] supports the practice of clearing out the axilla in every case. He has complete records of 44 cases. Out of 20 cases done prior to 1894, 7 have passed the three years' limit and are alive and well. In 13 the disease has returned, proving fatal in 11. In 7 of these the disease was internal, so that local recurrence took place in 5 cases out of the 20, a rather high proportion. Some of the cases were, however, very bad ones. This authority, after discussing the extensive operations of Halstead and Meyer, concludes as follows. His statement as a surgeon of ripe experience is worthy of close attention.

"I think it is very doubtful, whether some of these more extensive operative procedures, confer any additional immunity from recurrence at all commensurate with their severity. It is clear that in both classes of operation the majority of the fatal cases die of the internal metastasis without external recurrence, and against internal metastasis no operation can protect. It is very certain that but little good can result from these extensive measures, if there exists some deep-seated nidus of infection which is beyond the reach of the knife."

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[1] *Brit. Med. Journ.* 29th May 1897.

Having thus given a fair sketch of the results claimed by different surgeons in their varied operations, I would endeavour to lay before the reader the principles which should guide him in selection of operation, and prognosis after it.

From what has been said, it is clear that much difference of opinion still exists, and I feel confident that we need more extended and prolonged observation in cases submitted to such operations as those of Halstead and Meyer before we universally adopt them. The swing of the pendulum of surgical opinion is generally extreme, and has now turned from too slight to too extensive operating.

It seems to me that the same principle applies to the operative treatment of malignant disease (whether cancer or sarcoma) of the breast, as is the case elsewhere in the body. In early cases, especially when the growth is chronic, and the surrounding lymphatic area is not extensively infected, good results are obtained as to long freedom from return.

Chronicity of growth, before operation, generally means slowness of return after it. When the contrary exists, and there is a rapidly-growing tumour, with marked lymphatic and skin implication, the results of operations are generally poor, and some of the very extensive operations done in such cases may almost be said to carry their condemnation on the showing of the performers of them. I have stated that a doubt, I hope a rational doubt, has always existed in my own mind as to the possibility of absolutely removing an extensively infected lymphatic area with the knife.

To the naked eye, indeed, all may be cleared, but would the microscope not show us fragments of infected tissue, scattered cells, none the less certain to produce the disease because of their minuteness and obscurity? Accordingly, we may fairly rely upon the following statements which have been exemplified in the preceding chapters.

(1) In cases of small slowly-growing cancers, especially in spare women, free removal of the gland, the skin round the growth, the whole of the pectoral fascia, and obtainable lymph-

atic tissues from the axilla will give the best results as to long freedom from return. In such cases many years of freedom from return may be expected, and the operation should be strongly urged.

(2) In cases of a more advanced type, where one or more glands in the axilla are infected, the same operation gives good results. Removal of the sternal portion of the pectoralis major muscle is advised if there be marked glandular infection, or the tumour be adherent to the pectoral.

(3) In what are called "bad cases," including marked skin implication, extensive gland affection, and especially inflamed or acutely growing cancers of young pregnant or lactating women, if any operations are to be done, they should be designed to relieve local suffering only. Seldom are long periods of freedom from return observed.

(4) That some of the best results as regards prolongation of life, have been obtained in those cases when local recurrences are repeatedly removed.

(5) As regards the prospect of definite cure, as the term is understood by the public, *i.e.* definite eradication of the disease, leaving the organism in a healthy state, it is the duty of a conscientious surgeon to be exceedingly cautious in pronouncing such definite opinions as have emanated from the German schools.[1]

(6) Careful operating in early cases usually gives freedom for three years at least, and often much longer.

(7) Operations of such magnitude as removal of the arm, dividing the clavicle, the sacrifice of enormous areas of skin, are severe in the performance, painful in the endurance, slow in the healing, and almost inevitably disappointing in the ultimate results. I have seen the end of some of the latter class with painful œdematous upper extremities, tied to the side by neuralgic scars, and have not been impressed favourably by such results.

(8) In chronic atrophic cancer of the aged there are no demonstrated facts to prove that the old rules of surgery do not still hold good, and that life is not prolonged by operation,

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[1] This opinion of my own was quite borne out by the majority of London surgeons at the debate at the Med. Chir. Soc. in 1898.

while local suffering is in such cases absent or exceedingly slight.

(9) The results of the old operation where the glands are left are better than generally believed, but it is not now to be recommended. As years roll on, the results of the more extensive operation will show still better results.

(10) No one form of operation can be advised for conditions of such infinite variability as obtain in cancer of the breast, and in estimating the results as to prolongation of life after any one kind of operation, the eccentricities of the disease as to rate of growth or dormancy of growth must be taken into account. We must not assign entirely to the credit of surgery, what may be due really to the natural phenomena of an ill-understood disease.

CHAPTER XI

RECURRENT MAMMARY CANCER

Cancerous growths secondary to mammary cancer—Cancerous growth in breasts secondary to cancer elsewhere—Management of cases of recurrent disease, or of mammary carcinoma, when complete removal is impossible.

NOTWITHSTANDING improved methods of operating, local recurrence in the neighbourhood of the scar or axilla is still to be looked for in a certain proportion of instances after the removal of cancer of the breast. "Complete" primary operating will lessen the frequency very markedly of this condition, when the public and profession are alive to the importance of early treatment. The period at which recurrence may occur is exceedingly uncertain, and the published averages of time differ so much, that it is obvious little practical use accrues from an attempt to study the matter in this light. Early recurrences in the scar or neighbouring glands may be interpreted as meaning one of two things, either that the operation has been incomplete, or that the type of case has been so bad that infective elements have been left. On the other hand, the longer the period which has elapsed between the operation and the recurrence, the better the prospects for future years of freedom, the stronger the reason for operating upon the fresh manifestations. The majority of local recurrences seem to occur within two years, and if there be no signs of recurrence for three years, the prospects for the patient as to long freedom are exceedingly good. The recurrence of cancer has of necessity been alluded to in Chapter VIII., and these pages amplify what has been there stated.

The following table taken from the *Middlesex Hospital Reports* for the years 1875 and after, shows well the sites of local recurrence after the operation.

Out of 40 cases of recurrence, return took place in the scar of the primary operation in	20 cases
In the axillary glands	5 ,,
In the scar and glands	11 ,,
In the scar and opposite mamma	4 ,,
	40

Extensive infection of the skin is perhaps one of the most serious prognostic factors in cases of breast cancer. In such cases, unless the surgeon is prepared to flay the whole thorax, he can never make sure that he has removed all the disease. It is especially in these cases, that small dusky or livid nodules make their appearance in the neighbourhood of the scar within a few months of the operation. These are commonly called "regional recurrences." I prefer to assume that they are commonly not real recurrences at all, but rather evidences of the incomplete removal of the primary disease, the lymphatic channels being already infected. One of the most extraordinary features of some cases of recurrent cancer, is the period of time which has elapsed before the fresh manifestations have arisen. The argument that these are fresh outbreaks of cancer may, of course, be advanced. It is singular, however, in how many cases the disease attacks the scar or the neighbouring glands, as though the focus of infection was local, though for years dormant. As regards extensive operations where large areas are removed, the frequency of local recurrences is undoubtedly lessened, but whether visceral metastasis or outbreaks are in any way modified, I do not think we have evidence to show. Halstead's experience rather points to the reverse, metastasis occurring in a large proportion of his cases. In Cheyne's 61 cases 11 are noted to have had metastasis; and out of the 61 cases, 40 are reported at periods under three years, and it is idle to suppose that some of them may not suffer from visceral cancer as time advances.[1] Previous accounts of recurrences in the axillary glands must with modern views be taken with reservation. Undoubtedly, when this occurred early, the glands were really infected at the time of operation, the term "recurrence" being thus a clear misnomer. I am convinced that rapid return in the axillary glands, generally means timid or inefficient removal of the primary disease.

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[1] *Med. Soc. Trans.* vol. xix.

It sometimes happens that cancer recurs after operation with extraordinary virulence and rapidity. This is best exemplified by operations upon inflamed "brawny" cancer, especially in lactation or during pregnancy. Sometimes, however, the same unpleasant phenomena are observed in ordinary cases. Williams relates the following interesting example of rapid "recurrence" after operation:—

> A stout healthy-looking woman, aged sixty-eight, with very large mammæ, came under observation with a movable tumour of three months' growth, the size of a turnip, in the middle of the right breast. Immediately after removal acute diffuse recurrence set in which involved the whole wound. Death ensued six weeks after operation from cancerous hydrothorax, the disease having extended through the chest wall. The right pleura, diaphragm, and liver were found studded with cancer at the autopsy.[1]

An obvious comment upon this case is the possibility of some of these growths having really existed unsuspected before the operation, though the continuous spread of the disease through the thoracic walls, is very suggestive of excessive malignancy and rapidity of growth being excited by the operation.

The occurrence of cancer in other organs when the mamma is affected, is very variable in its choice of locality, but very commonly found. R. Williams in 34 necropsies, in which death occurred in the natural course of the malady, found deposits at the rate of 73 per cent. At the Middlesex Hospital, where especial opportunities are afforded for the examination after death of cases of cancer of the breast, Nunn found deposits in 58 per cent out of 102 necropsies. Williams states that the average duration of life after the appearance of metastasis is about two years, but it is obvious that it must be extremely difficult, if not impossible, to strike trustworthy averages regarding a class of cases so protean in their behaviour and progress. In Williams' 44 cases the liver, lungs, pleura, and bones were affected in this order of frequency.

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[1] *Diseases of the Breast*, p. 218.

Bramwell[1] gives an excellent example of disseminated cancer with a plate showing the extraordinary number of nodules of cancer in the skin which sometimes manifest themselves. The case began as a hard "scirrhus" below the left nipple, and the woman died in three years. Half a year before death numerous nodules began to form in the integu-

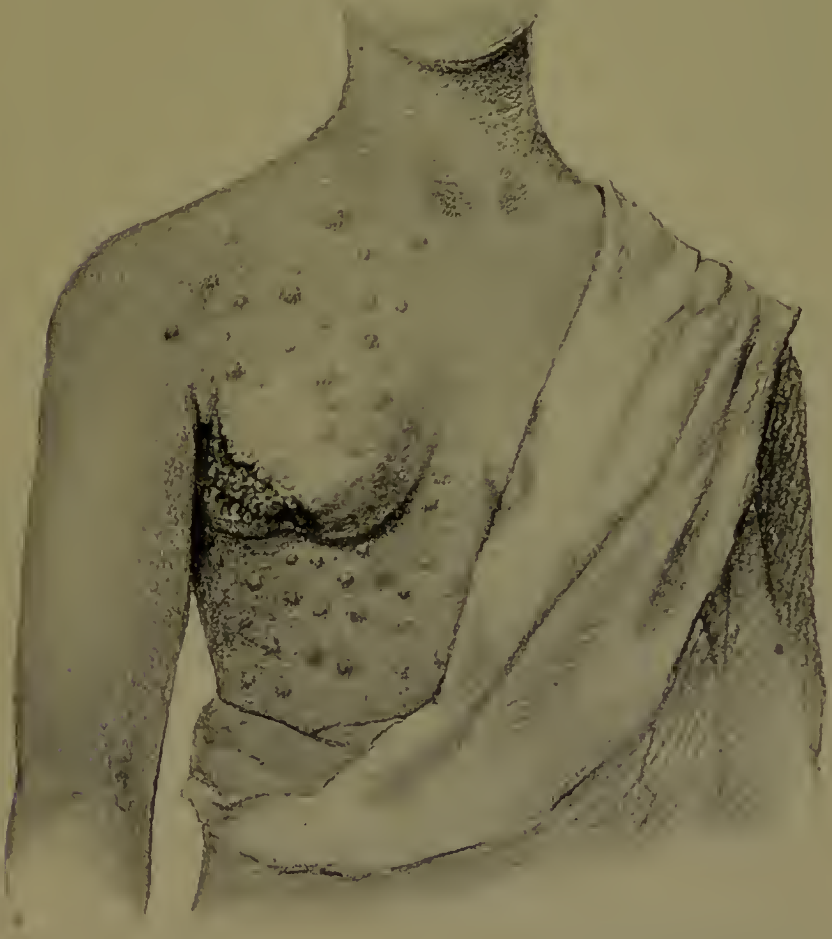

FIG. 55.—Disseminated nodules of cancer in the skin secondary to carcinoma of the breast, from a case of the author's.

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[1] *Edinburgh Medical Journal*, August 1894.

ment of the mamma, and she was unable to stand owing to a painful swelling in the shaft of the left femur. Secondary growths were found post-mortem in both breasts, the lymphatics, the skin of the trunk in front and behind, the liver, spleen, kidneys, suprarenals, ovaries, pancreas, stomach, peritoneum, etc. The meninges of the brain and cord had not escaped. The spleen was converted into a cancerous mass, a condition of comparative rarity. The lungs, oddly enough, escaped. The tumour in the left mamma seemed to be an ordinary fibro-adenoma. On this point Dr. Bramwell was kind enough to get for me the opinion of Mr. Stiles, who reports that in addition to the "fibro-adenoma" there was cancerous infiltration as well. "I may say," writes Stiles, "that in addition to the general infiltration of the breast with cancer, there was a tumour situated pretty much in the centre of the mamma; it was about the size of a pigeon's egg, and could be readily shelled out. To the naked eye it was pale, very firm and fibrous-looking.

"Microscopically, it was made up of dense fibrous tissue, very poor in cell-elements. There were scattered amongst it, at wide intervals, a few compressed gland tubes containing small atrophied-looking cells. It was in no way invaded by, or connected with, the surrounding carcinoma.

"I have seen an exactly similar condition in another case, where the cancer in the mamma was also diffuse, but did not invade the small fibro-adenoma which was embedded in it."

A very similar case is related in the *Lancet* of 1887, vol. ii. An emaciated woman, aged thirty-six, was in the London Hospital with scirrhus of both breasts. The subcutaneous tissues of the thorax were widely covered with disseminated nodules, hard, round, and free. They slipped about like foreign bodies under the skin. A nodular cord led from the cancer in the left breast to the axilla. The little growths could be reckoned by the hundreds.

The table of Gross, quoted by Bryant, gives an excellent summary of the comparative frequency of metastases in different parts of the body. This table is the result of 128 post-mortems made by adding the cases of Gross to those recorded in vol. xxvii. of the *Pathological Society's Transactions*.

Out of 128 post-mortems—

The	axillary glands	were	affected in	115	instances,	or 89	per cent.
,,	other glands	,,	,,	30	,,		
,,	lungs	,,	,,	28	,,	,, 45	,,
,,	pleura	was	,,	30	,,		
,,	liver	,,	,,	55	,,	,, 43	,,
,,	ovary	,,	,,	7	,,		
,,	bones	,,	,,	9	,,		
,,	stomach and kidneys		,,	5	,,		
,,	other organs in a far milder degree.						

The whole subject of the distribution of secondary growths or cancer of the breast is well summed up in a paper by Mr. Stephen Paget.[1] This author quotes largely from the Middlesex Hospital Reports.

> Out of 735 necropsies after cancer of the breast 241 had cancer of the liver, 17 cancer of the spleen, in 70 the lungs or pleura were involved, in 30 the kidneys or suprarenals. The ovaries were involved in 37 cases. Attention is drawn to the remarkable distribution of secondary growths of cancer in the bones, and to the predisposition the disease seems to have to attack some bones in preference to others. Out of 650 necropsies there is not a single case of affection of the bones of the feet or hands, of the radius or ulna, and only one of the tibia. Yet the femur was affected 18 times, the humerus 10 times, and the cranium 36 times.
>
> In a notable number of cases also cancer of the breast is associated with a remarkable brittleness of the bones, which causes them to fracture spontaneously without any distinct evidence of cancer. Fourteen cases are related of this little known and remarkable condition, from the necropsies conducted by German pathologists,[2] and from the Reports of the Middlesex Hospital.

The concluding remarks are worthy of attention. In 903 necropsies collected by German surgeons of cancer of the stomach and pylorus, the bones were not affected in a single case. How then can the secondary deposits of cancer of the breast be due to the chances of embolic infection? Evidence of the secondary deposits may easily be more striking than those of the primary disease, which may consequently be overlooked.

Mr. Paget concludes from his observations that the distribution of metastatic cancer can hardly be founded on mere chance, but rather on some peculiar receptivity of the soil on which the infective element happens to lodge.

A valuable account of the relative frequency of implication of various structures in secondary growths after removal of the mamma is also given by Coupland. His table is compiled from the records of the Middlesex Hospital, where unusual and accurate opportunities are afforded for studying this question. His results are, perhaps, largely embodied in Paget's paper, but they are so instructive as to deserve separate quotation.

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[1] *Lancet*, 23rd March 1889.

[2] *Arch. für klin. Chir.* 1880, vol. xxv. p. 873.

In a total of 89 cases there were secondary growth in—

The axillary glands in	81 cases
Other lymphatic glands	25 ,,
Pleura	21 ,,
Pericardium	2 ,,
Peritoneum	3 ,,
Lung	14 ,,
Stomach	1 ,,
Liver	35 ,,
Pancreas	1 ,,
Spleen	2 ,,
Kidney	2 ,,
Suprarenals	1 ,,
Ovary	7 ,,
Uterus	1 ,,
Bones	5 ,,

With regard to cancer of the ovary, secondary to that of the breast, these results must be taken with reservation. The structure of malignant ovarian growths is very complicated, and is in need of fresh investigation. The enormous preponderance of secondary growths in the glands, pleura, liver, structures in direct lymphatic relation with the breast, is a significant argument against those who consider these manifestations "fresh outbreaks" of cancer.

These results make evident to the practitioner the localities where deposits of cancer after removal of the breast may be expected to arise. As many of these cases pass after operation into the hands of the family doctor, this part of the subject is of peculiar interest and importance, since many recurrences, especially when affecting the nervous system, are peculiarly obscure, and very liable to be misunderstood. The cases presently to be quoted will be of interest and important from this point of view.

There has hitherto been a general consensus of opinion that carcinoma of the breast recurs in the cicatrix rather than in the axillary glands. Gross, writing in the *American System of Gynæcology*,[1] finds that out of 496 local recurrences about 59 per cent were in the mammary region alone, and about 23 per cent in the axillary glands and mammary region. In about 15 per cent the adjacent lymph glands were affected alone. In the consideration of these cases we have no exact information as to the method of operation, or the thoroughness with which the axillary glands were detected and removed. Doubtless in many instances the glands were in a state of early infective activity at the very time of operation.

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[1] Vol. ii. p. 301.

Out of 50 cases of recurrence admitted to St. George's Hospital between the years 1865 and 1895, the proportion of instances when the axillary glands and cicatrix were separately affected, was nearly equal, there being a slight preponderance in favour of recurrence in the immediate neighbourhood of the scar. But in 20 cases, when the scar was affected, the axillary glands were also implicated. These results, like many hitherto quoted, were taken from cases where the axilla was not thoroughly cleared at the operation, and it may generally be said that the positions of local recurrence, after the modern operation of removal of the breast, will need some years of further investigation. I venture to advance the opinion that while it will be certain that local recurrences will be found far more rarely, they will occur rather in the neighbourhood of the scar than in the axilla, when the lymphatic tissues have been properly removed.

Out of the post-mortem records at St. George's one fact stands out prominently, the extraordinary frequency with which the liver is involved in the secondary metastases of mammary carcinoma. This fact is very important, and it may be pointed out, as a matter for great reflection, that though the spleen has equal facilities for infection, the proportion of instances of secondary growths in this organ are comparatively very rare.

It seems hardly logical to assume that cancer of the ovary, uterus, or liver, occurring perhaps years after an amputation of the mamma, are true recurrences in the strict sense of the word. Their occurrence, however, is very mysterious and significant, and at present wrapped in obscurity. All researches on this matter seem to point to one of two things: either that certain individuals have their tissues predisposed to cancer growth, or that the elements of cancer may in certain parts be disseminated from a primary focus, and long lie latent, being started into activity by some cause we know not of. It is easy to offer pages of theory on such points. The practical point to remember is the tendency to such growths in patients who have had the breast removed for cancer, even though the three years' limit, termed "cure," be passed.

I now prefer to point out the symptoms which may be expected in these cases. Any treatise on medicine will offer ample information upon the subject of carcinoma of internal organs, as the liver, and this will not be advanced here. Few cases are more mysterious and difficult, and, I may add, few are found in which more serious diagnostic errors are constantly made. I may venture to lay down this rule. When a patient, who has had the mamma removed for carcinoma, develops symptoms pointing to diseases of the liver or pelvic organs, presents mysterious dyspnœa, attacks of hydrothorax, rapid peritoneal effusions, and the like, the thought of recurrent carcinoma should ever present itself to the mind of the judicious practitioner. In the case of carcinomatous ovaries, there is always a chance of giving temporary relief by operation.

It is impossible in the present work to give a detailed account of carcinomatous disease in all the organs. Ordinarily, after amputation of the breast for carcinoma, the evidences of visceral growths, when they occur, are clear enough. Stress will therefore only be laid upon cases of recurrent breast carcinoma in situations which present peculiar features, and which, though often occurring in practice, are very liable to misinterpretation. Prominent among these are cases of recurrent cancer in the nervous system, thorax, and bones.

Secondary Carcinoma of the Brain and Meninges.—Cancer within the cerebral cavity, secondary to cancer of the breast, is rare. The late Mr. Hulke, who had special opportunities for observation, mentioned that of all the cases that had come under his notice, only three or four suffered from secondary nodules in the brain. He related the case of a woman who was admitted into a medical ward suffering from such symptoms of brain tumour as lethargy, severe headache, and double optic neuritis, with retinal hæmorrhage. A small shrunken "scirrhous tumour" was found in the left breast, and she also bore an ovarian cyst. After death the left cerebellar lobe was a mass of secondary cancer, and there was also a nodule in the left inferior parietal lobule. There was a secondary cancer of the liver.[1] Carcinoma of the cerebellum, secondary to mammary cancer, is also related by Andrew.[2] The growths were found on both sides, and one of them was the size of a pigeon's egg.

A woman, aged forty-two, was admitted into St. George's Hospital on 19th December 1894. She had been deaf from middle ear catarrh all her life. She now had headache, with slight ptosis and spasm of right eyelid with a tendency to sickness. In May 1893 the left breast had been removed for undoubted carcinoma. The site of the old operation was quite healthy, there being absolutely no signs of recurrence, nor were there any enlarged glands in the axilla. The patient had obscure headaches for some weeks, with dimness of sight, which was getting worse, and with pain over the eyes.

Mr. Frost examined the eyes and found marked optic neuritis. There was not hemianopia, but the condition of the discs was consistent with cerebral tumour.

Headache of a localised character over the left temporal region became worse and worse, and the right pupil became dilated. Right facial paralysis gradually came on, varying in degree from time to time. On sitting up the patient became very giddy, and sometimes she was noisy, crying and talking nonsense. She often passes her excretions into the bed. This woman became more and more drowsy, and died in February 1895. The whole of the left optic thalamus and corpus striatum, was converted into a soft hæmorrhagic cancerous growth showing spheroidal-celled carcinoma under the microscope. There was no trace of disease in the scar or other parts of the body, the examination being conducted with much care by Dr. Cyril Ogle, with whom I had the advantage of examining the brain.

Clouston relates a case to show that the symptoms of intracranial carcinoma may be largely mental. A woman, aged fifty-six, who had always been of "weak mind," had borne a hard carcinoma of the mamma for two years. Suddenly her mental symptoms were aggravated, and she became acutely maniacal, with suspicions and delusions. She imagined that "resurrectionists" were about her, and she slept with a hatchet beside her at night in order to protect herself! At her death the head was examined, and cancerous deposits were found lying inside the dura mater, and described as nearly half an inch in thickness. They were irregularly deposited over the left side. No mention is made of motor paralysis.[3]

Nunn relates a case of a woman, aged forty-nine, whose case he observed for eight years. The right breast was amputated; recurrence occurred in two years, with extension to the opposite side. During the last months of her life the patient became almost fatuous, wagging the head and mumbling inarticulately. At the autopsy, in addition to other changes, a cancerous tumour the size of a racquet-ball was found at the base of the brain.

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[1] *Lancet*, 6th December 1879.

[2] *Trans. Path. Soc.* xxi. p. 2.

[3] *Journ. of Mental Science*, 1879, vol. xxv. p. 219.

A woman, aged thirty-two, had her breast removed in 1870 in a London hospital. The operation was done in May. In December of the same year the patient died, under the care of Dr. Reid of Wokingham. He relates that slight paralysis appeared on the right side in the month of August, but passed off, leaving her with violent headache and some defect of speech. The aphasia became complete and the hemiplegia returned. Post-mortem, two deposits were found in the substance of the left hemisphere of the cerebrum. They were quite characteristic of "scirrhus," and the size of a pigeon's egg. There was no local recurrence in the scar.[1]

A case where cerebral tumours followed the removal of an "encephaloid" (sarcomatous ?) breast is related by Mr. Sydney Jones.[2] The tumour of the breast had been removed two years before by Solly. The patient now complained of severe and incessant pain in the head, referred to the vertex. A little time before her death motion began to be impaired on the left side, and she had convulsive attacks. In the left hemisphere a tumour the size of a marble was found resting upon the corpus callosum. A smaller one, the size of a bean, was found on the outer side of the right corpus striatum. The tumours were comparatively hard as compared to the brain; they were yellow on section and yielded a creamy juice. A microscopical account of the appearance of the cells is given, but not such as to enable one to say the exact nature of the growths. They were probably sarcomatous.

A widow, aged sixty-seven, had the breast removed for a small growth near the nipple associated with a much larger mass in the axilla. This operation was performed at St. George's in November 1886. The tumours were "cystic," but contained blood and were associated with solid growth (?duct cancer). The arm was œdematous, and because of the great involvement of the axilla complete removal was out of the question. This woman died in April 1887, in the National Hospital for Paralysis and Epilepsy, with a tumour the size of a walnut in the right hemisphere, at the lower end of the fissure of Rolando. Curiously enough, one or two secondary growths were found in the spleen. The microscope showed the characters of carcinoma.

Recurrence of carcinoma in the spine is sufficiently common after removal of the breast, and the same is true in cases of breast cancer when the growth has long remained concealed or not noticed by the patient. So important is this fact, that if an elderly woman should develop paraplegia, especially of a painful character, the surgeon should never neglect to make a careful examination of the breasts. The symptoms come on insidiously, with "burnings and tinglings" in the feet and lower limbs, or "girdle pains" round the thorax and abdomen. Sometimes obscure bladder symptoms may occur or retention of fæces, and if the disease be situated high up in the spine, the symptoms may be very complicated, and such are only too apt to be mistaken for hysteria. As a rule the pain in these cases becomes agonisingly acute, if any of the peripheral nerves are included and compressed in the remorseless grip of the contracting growth. But I have known cases associated with complete paraplegia and signs of transverse lesion of the cord, where there was comparatively little pain. Should the bodies of the vertebræ be extensively affected, an obtuse curvature may present itself. When acting as assistant surgeon to Charing Cross Hospital, I happened to see two cases in one month where secondary cancer in the spine had produced curvature. One patient, a woman of sixty, had borne a large mammary growth for two years, the other for eighteen months. Both cases were, of course, unfit for operation, being nearly paraplegic.

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[1] *Path. Soc. Trans.* vol. xxii.

[2] *Ibid.* vol. viii.

A woman, aged fifty-six, was admitted into St. George's Hospital on 27th June 1894. Six months before admission she felt pain and stiffness in the lower part of the back, also severe pains in the knees, supposed to be due to "rheumatism." For the last month she had suffered from agonising "girdle pains," and could hardly be moved without excessive suffering. Two months only before admission she noticed a retraction of the right nipple, and thus her attention was first called to a tumour growing in the breast. In the right breast there was a scirrhous cancer, with the usual clinical characteristics. There was great pain and tenderness over the lower dorsal spine, but no motor or sensory paralysis of the legs. The urine had to be drawn by a catheter, and was alkaline. She remained in the hospital for about four months, emaciating rapidly, and pain being relieved with morphine. She died apparently exhausted. She had no idea that she bore a breast tumour until it was discovered by others.

A very striking case of insidious painful paraplegia dependent upon growths secondary to old concealed carcinoma of the breast, has been kindly communicated to me by Dr. Gerard Smith of Gloucester Place, and I append a short *résumé* of his extensive notes of a case well worthy of reflection and perusal.

The patient was a strong, healthy woman, aged fifty-two. For twelve years she had a slowly-growing nodular growth, obviously carcinoma, in the left breast, which gave occasional lancinating pain. She concealed this affection, and it was only revealed in the later stages of her fatal malady. The illness commenced in 1894, with intractable sciatic and lumbar pain appearing like ordinary rheumatism, but resisting all treatment, both at home and abroad, until she was quite disabled from walking. There was no fever or constitutional disturbance. In 1895, within a week's time, she developed a rapidly increasing and extremely severe neuralgia of the back of one hand and on both sides of the neck, coming on daily in severe paroxysms. In the last week of 1895 she lost power over the tongue and fauces, the tongue being protruded to the right. Speech and power of swallowing became gradually impaired, as in bulbar paralysis. Next extreme hyperæsthesia of the skin of the neck and thorax was noted, extending also down both arms. The temperature now rose to a great height. As the case went on, paralysis of motion in the arms and intercostal muscles appeared, respiration being abdominal, and finally complete paraplegia occurred from the lumbar region downwards, with complete loss of sensation. Large gangrenous patches appeared on the skin of the legs, leaving sloughing cavities. The electrical reactions were tested by Dr. Lewis Jones, who found that reaction to galvanism was absent, but that slight faradic contractility was manifest in irregular areas in the calf and thigh. The patient died from "exhaustion and profuse discharge." The mammary growth proved to be a hard, puckered, atrophic carcinoma. It is noteworthy that, as is so common in this type of growth, glandular infection was absent, though it had existed for years. Carcinoma was found invading the bodies of the second, third, and fourth dorsal vertebræ, growing into the spinal canal and compressing the cord. The cord below was soft and diffluent. There was no change in the shape of the vertebræ. The post-mortem was of a limited nature, and explanation of all the curious symptoms was therefore not complete.

In 1896, Mr. Bridges, then house-surgeon to the Great Northern Hospital, communicated to me the particulars of a case under the care of Mr. Lockwood, where symptoms of cancer of the spine showed themselves in a woman, aged forty-three, about twelve months after the removal of the right breast for carcinoma. The operation was very thoroughly done, and the scar and axilla were quite healthy. But about nine months after the operation she began to suffer from severe lumbar pains, passing also down the left hip and leg. There was marked local tenderness over the lumbar vertebræ. The left leg became almost completely paralysed, with atrophy of the muscles and much wasting. There could be no doubt that this woman had a cancerous growth in the lower lumbar spine.

A woman, aged forty-five, was admitted into St. George's Hospital in

May 1883, for paraplegia. She was under the care of Dr. Howship Dickinson. For two months she had complained of severe "burning and catching" pains in the hypochondrium, and soon she lost power over the legs, which became quite motionless. It was soon discovered that this woman, who looked sallow and ill, had disease of the left breast. There was a hard, shrunken, lobulated tumour, which had existed, without inconvenience, for no less a period than fourteen years. The axillary glands, it is well to remark, were not infected, so far as could be ascertained. The legs became totally motionless, and the patient lost control over the bladder and rectum, a large bed-sore forming over the sacrum. She became feeble and died. At the post-mortem, secondary masses of growth were found in both lungs. The fourth and fifth dorsal vertebræ were implicated in a new growth, which also affected the fourth and fifth ribs close to their heads on the left side. The spinal cord was compressed at this point, but its structure seemed normal.

This case is also of extreme interest as showing how atrophic cancer may exist for years in the mamma, and finally be associated with fatal metastasis.

To relate one of these cases is to relate them all. Severe neuralgia followed by anæsthesia or loss of motion, is generally to be interpreted as due to pressure of a growth on a nerve-trunk. Any one who reflects upon what is here written, will not let the thought of infection from a focus in the mamma pass out of his mind, if such symptoms should occur in an elderly woman without obvious cause. The situations of the growth may be most various, and the particular symptoms must vary in consequence in each individual case, according to the nerve areas involved.

The subjects of carcinoma of the breast after removal, or where long-continued growths have existed, are liable to carcinoma of the pleura or lung. The symptoms are then of the usual nature found in such cases. The pleura becomes thickened, studded with nodules and plates of cancer, and the contained fluid is usually blood-stained. Cancerous hydrothorax is apt to supervene with great suddenness, and may rapidly carry off these patients unless paracentesis be early performed.

A woman, aged sixty, was in St. George's Hospital in November 1891; she was in one of the beds of the "Cancer Institute" under the late Mr. Rouse, as her case did not admit of active treatment. She had attended as an out-patient for about four years, with a small carcinomatous tumour of the left breast, which she would never have removed. For six weeks she had suffered from severe shooting pains over the left side of the neck and face. The cancer was withered and atrophic on admission, and the glands in the axilla were not affected. There was a hard swelling over the left parietal bone, and another at the back of the neck, deep towards the base of the skull. During the months of December and January she remained in much the same state, but has had some severe attacks of respiratory trouble termed "asthmatic." On the evening of 3rd February she was noticed to be very "blue in the face." On the morning of the 4th February she died rather suddenly, intensely cyanosed. Post-mortem, the cause of death was found to be double hydrothorax and cancer of the pleura. There was no malignant disease in the bones.

The lungs and mediastinal glands are sometimes found converted into huge masses of cancer in these cases, and the respiratory passages and recurrent nerves may readily be implicated.

A fine specimen to illustrate this condition will be found in the museum of the Charing Cross Hospital (1072). A woman, aged fifty-five, had her right breast amputated for "scirrhus" five years previously. For two years before her death she had complained of intractable and severe pain in the mid-sternal line, with increasing dyspnœa and exhaustion. A patch of ulceration appeared over the sternum, and a discharging sinus remained. The specimen shows an enormous mass of cancer behind the sternum, which here is thickened, infiltrated, and at one point perforated by an irregular aperture.

True recurrence of cancer in the bones is perhaps more rare than is generally believed. At the same time it is right to point out that certain observers assert the exact opposite, that this condition is far more common than is generally stated, the infection of the medulla of bone being extensive and insidious, and often not carefully enough looked for, by those who make autopsies upon these cases. The frequency of infection of the humerus and femur is very remarkable. Vague "rheumatic" pains about the bones should always raise suspicions of metastatic disease, in those who have or are known to be suffering from carcinomatous mammæ. If spontaneous fracture of the femur or humerus occurs in an elderly woman, the breast should always be examined, and an atrophic cancer may be found of which the patient has little or no cognisance, or the scar of an old operation may be at once apparent. It is noteworthy, as especially pointed out in the

Middlesex Hospital Reports, that fractures in these cases may be due to mere undue brittleness of the bones, without any evident deposit. At all events such fractures not uncommonly reunite, and that firmly, so that in the case of the femur a patient may be able even to walk. Again, I have observed cases where after reunion tumour growth has shown itself.

A case well illustrating many of these points was brought before the Pathological Society of Manchester, by Mr. Richmond, on Wednesday, 13th February 1895.

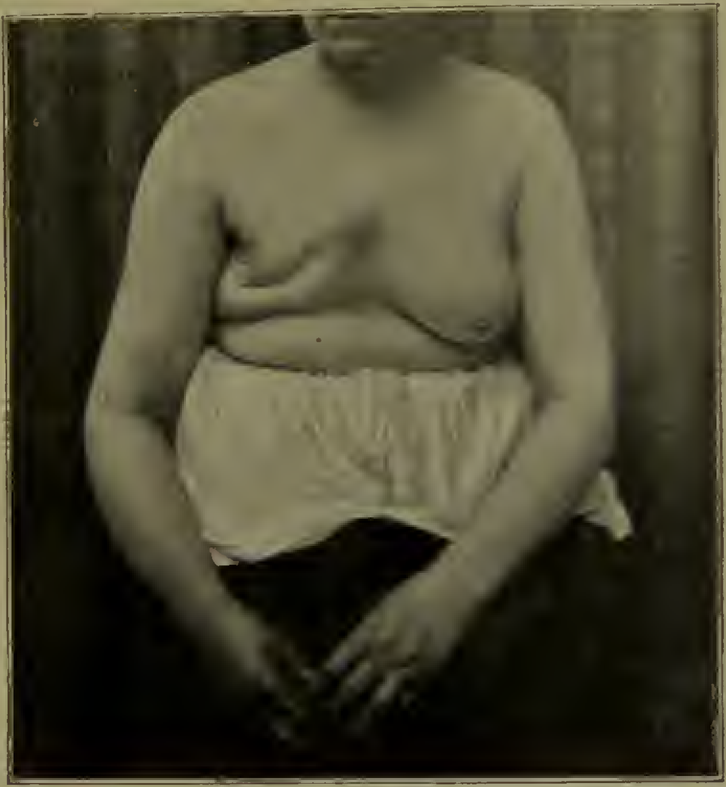

FIG. 56.—Recurrence of carcinoma in sternum after removal of mamma.

He related a case where osteomalacia and spontaneous fracture of the femur occurred in a patient who had been the subject of a scirrhus of the mamma. The breast and axillary glands and fat were thoroughly cleared away, and there was no local recurrence. Visceral deposits, however, followed very rapidly, and the patient succumbed about five months after operation. Before this, bone-softening was observed in the pelvis, and the left femur, the diameter of which was much increased, snapped across when the patient was getting into bed. Fair union was obtained in four to five weeks, with disappearance of much of the thickening. Sections of the original breast tumour, of the liver, and of the iliac crest were shown, all exhibiting cancerous growth. The fractured femur also was shown, and a decalcified section taken from the site of bony union entirely negatived the presence of cancer at this spot, and merely showed the ossification of fibrous callus.

A woman, aged fifty, was in St. George's Hospital under Mr. Pick's care in November 1896. A fortnight before admission she was lifting a heavy weight, when she felt something "snap" near the right shoulder. On examination the right clavicle was fractured about the centre, greatly thickened, and surrounded by a mass of apparently newly-formed callus. A considerable area of the shaft of the bone appeared to be implicated. In the right breast was a hard atrophic mass of scirrhus the size of a large orange. The skin was adherent and ulcerated at one spot, being there covered by a brownish scab. The nipple was deeply retracted, and the axillary glands much enlarged. This carcinomatous growth had never given her any pain or inconvenience, and she did not know how long it had been present. Her general health is good, and there are no signs of any metastatic deposits elsewhere. The termination of this case was exceedingly interesting. The bone firmly united, and three months after, the injury presented the usual characters of a fractured clavicle, the site of lesion being marked by slight thickening only. The apparent tumour growth was merely exuberant callus, produced by the movement of the fragments. She died of pneumonia, apparently not connected with the

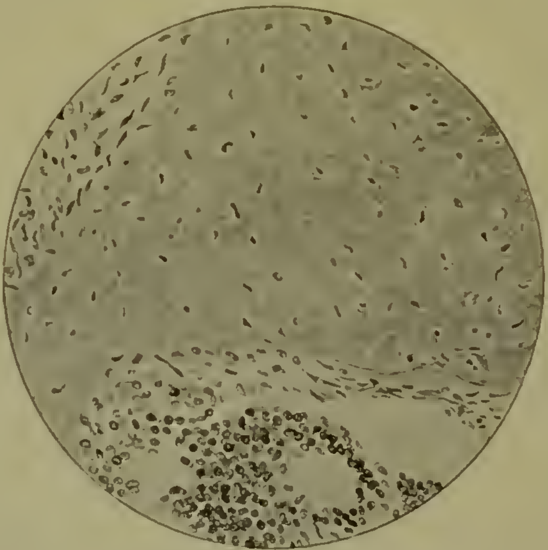

FIG. 57.—Section of a bone which had united after spontaneous fracture, subsequent to mammary cancer. A group of cancer cells are seen at the lower part of the section.

carcinoma, in 1897. The clavicle had firmly joined, and there was nothing abnormal to the naked eye. On section one or two soft pinkish spots were seen, and under the microscope this showed spheroidal carcinoma. The cause of the spontaneous fracture was thus clear.

A stout woman, aged sixty-three, was admitted into St. George's Hospital for the following conditions. She was getting into bed on the morning of the 20th, when suddenly the right thigh broke with a snap. Previously she had suffered from severe pains in the thigh, reported to be rheumatic. In the right breast is a small hard scirrhous tumour, showing all the usual characteristics of the disease. She was quite unaware this existed, and could give no history of it. The right femur was broken about its centre. On 8th November the fracture was put in a Desault's long splint and short splints; there was nothing worthy of note about the fracture.

On 28th November the limb was examined. She had been in bed five weeks and four days. The fracture was united.

On 15th January 1895, I again examined the limb. It felt greatly thickened at the site of fracture, but it was impossible to say if this was "callus" or a new growth. This patient was discharged walking with crutches in two months.

In August 1895, while walking the bone again gave way "at the same place." The limb swelled enormously and she died. I was unable to obtain an autopsy, but the medical man in attendance had no doubt of great tumour growth at the seat of fracture.

Mr. Pearce Gould[1] once explored very carefully by operation the fractured humerus of a lady whose breast had been removed for carcinoma five years previously; no sign of tumour was visible; the wound was closed, but two months later an extensive growth had appeared at the seat of the fracture.

Attention may here be drawn to the fact that "secondary growths" in the breasts from cancer of other parts seem curiously rare. I can find no mention of such cases in our extensive post-mortem records at St. George's Hospital, but the point may easily have been overlooked.

That secondary growths may, however, be found in the mamma in cases of general disseminated cancer, is well shown by a reference to a remarkable case in the Middlesex Hospital under the care of Mr. H. Morris.

A woman, aged thirty-four, had carcinoma of the cervix uteri, and the symptoms seemed to prove that this was the primary affection. She soon noticed a "lump" in the right breast, and other tumours began to show themselves, so that there were four or five distinct tumours in the right breast, and several in the subcutaneous tissue over the left mamma. At the post-mortem examination hardly an organ was free from carcinomatous disease, and the breasts were so infiltrated that hardly any breast tissue could be made out.[1]

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[1] *Brit. Med. Journ.* 25th April 1896, p. 1035.

In a case of mediastinal growth recorded in detail by Dr. Pollock,[2] it is stated that towards the end of the case three small hard tumours formed in the right axilla and arm. A small hard tumour was also observed in the left breast, and after death this was stated to be carcinoma. There are no details of the actual nature of the mediastinal growth, and it is possible the cancerous tumour may really have been primary.

A woman, aged fifty, was the subject of "consultations" at St. George's Hospital on 30th July 1894. She had well-marked cancer of the rectum. She refused treatment, but returned to the hospital on 9th January 1895. She had then in her left breast a well-marked carcinomatous tumour with a small nodule in the skin. This had only been forming for two months, and was clearly subsequent to the rectal cancer. This is the only case of the kind I can recollect to have seen or taken notice of. The patient was never operated upon, and again left the hospital.

Such being some of the more important facts connected with the recurrence of cancer after operation, the treatment of these conditions must now engage our attention. In many of them, when the disease attacks the bones or the internal viscera, the case must be managed in accordance with the ordinary principles of medicine and surgery. As regards strictly localised recurrences, in the chapter on operative surgery, the indications for and against operative treatment are shortly described. The medical attendant will ever bear in mind, that some of the best results which have been obtained in prolongation of life after operations for carcinoma of the breast, have been those where small nodules have been early detected and removed. Every six months at least the patient should submit to examination, so that recurrences may be early dealt with. Too often delay is encouraged, trying this or that inefficient remedy until the disease has assumed a hopeless extent or proportions. A great responsibility rests upon the medical attendant in these cases, in encouraging and persuading the patient to undergo operation for recurrence while the growth is yet small, and consequently the ordeal slight. The conclusion of this chapter will be devoted to a consideration of the methods of treatment other than operative, which have been employed in cancer, and a sketch is given of the management of inoperable cases, not the least important from the point of view of the family practitioner, upon whom devolves the management of these most trying cases, towards the years or months which precede their decease.

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[1] *Medical Press and Circular*, 1896, vol. i. p. 559.

[2] *Path. Soc. Trans.* vol. iii.

It may be at once stated that no drugs appear to have the power of permanently checking the growth of cancer. There is scarcely a remedy in the Pharmacopœia which has not been vaunted at some time or another, and the improvements which have been asserted to occur, can generally be explained by the too little known peculiarities and vicissitudes of growth of the disease, or by the fact that the treatment has benefited such inflammatory complications as infiltration, sloughing and the like, so often associated. Some of the remarkable arrests of growth of carcinoma I have instanced, would certainly have been attributed to any special drug which the patient might at the time have been taking. Should spontaneous sloughing and subsequent cicatrisation occur, the drug taken at that period will obtain the credit. This is fostered by the credulity of patients and their friends, and last but not least, by our own blameworthy action of taking up that attitude of hopelessness in regard to recurrent cancer, which so often induces patients to place themselves under the hands of any one who will promise them cure or relief.

As every woman who has an affection of the breast is apt to believe it to be cancer, so this opinion is fostered by ignorance or design, and consequently we hear of the "absorption" of cancer by electricity, by pressure, by iodide of potassium, and the like. Such cases when severely analysed, will be proved to be spontaneous disappearance of cysts, of inflammatory or syphilitic indurations, or if the tumours are really cancerous, their reduction can always be explained by some of the ordinary pathological vagaries of the disease. Long periods of freedom from recurrence after operation are found when the patient is taking no remedies. This will probably explain the reality of such cases as those related by Sherman Wright, in the *Annals of Surgery* for October 1895. He relates several cases of freedom for six and four years after operation, and attributes this success to the use of bromide of arsenic in doses of $\frac{1}{40}$ to $\frac{1}{10}$ grain. It would serve very little useful purpose to mention all the remedies which have been given for cancer. They would alone fill a considerable chapter. In our own time, the Chian turpentine, calcium sulphide, arsenic and condurango, have all their adherents. I have certainly seen diminution of cancerous tubers under large doses of thyroid extract, but have always associated this with a diminution in the surrounding inflammatory associated contions,or in the depression of the health and circulation associated with the use of the drug. As regards the Chian turpentine, repeated cases go to show that it is not without influence on some cases of cancer of the female genitals. In cases of fungating scirrhus of the breast, I am as sure as I can be of anything in therapeutics, that this drug sometimes aids in promoting the sloughing and cicatrisation which have been observed in these cases, and which is so often erroneously termed cure. The carbonate of calcium in doses of 5 to 20 grains three times a day was at one time highly extolled, especially by Hood.[1] The case he mentions as cured by this remedy was undoubtedly one of atrophic cancer, the drug having nothing to do with the result. I have seen Chian turpentine tried in both sarcoma and cancer without any result, except to seriously damage the digestive powers of the patient.

Caustics.—Removal of a primary cancer, with the entire breast, by caustics of a violent nature can no doubt be effected, but it is improbable if this treatment will ever again come into vogue. It was terribly painful, associated with sepsis, and the uncontrolled action of the escharotic actually sometimes opened the pleural cavity.[2] It is a treatment I would strongly oppose, and therefore I do not propose adding to the bulk of this work by detailing it, or giving an historical account of its employment. It is far otherwise, however, with the employment of escharotics in some cases of incurable cancer, where the patient is much distressed by fungation and discharge. I feel sure we do not give these remedies sufficient scope in such cases. The temporary improvement effected by removing a mass of fungating cancer is often very remarkable, and our minds should always be open to advise its performance. It is essential (1) that the tubers of the disease be entirely destroyed and not merely irritated; (2) that cases are not thus treated where the destruction of the disease would open the pleural cavity or destroy the tissues of the axilla. The instances where caustics can safely be used are therefore very limited.

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[1] *Lancet*, 1867, vol. ii. p. 454.

[2] This incident occurred at St. George's Hospital in the early sixties, and the patient died.

The principal escharotic agents that have been employed from time to time in the destruction of cancerous growths are as follows:—

Arsenic.
Antimony.
Bromine.
Iodine.
Perchloride of iron.
Zinc.
Nitric Acid.
Acetic Acid.
Sulphuric Acid.
Resorcin.
Potash.

Arsenic has long held a leading place among the local caustics for removing a cancerous mass. I have carefully considered the various formulæ of various authorities, and have read the cases published by them. While allowing that the remedy has produced some remarkable successes, cases have here and there occurred of arsenical poisoning, and I would never advise or employ a remedy the action of which is so uncertain. The same remarks apply to the chloride of antimony, and I shall not give any of the formulæ for the use of these agents. In addition to gastro-intestinal symptoms severe neuritis may be induced.

Bromine and iodine have been employed as caustic agents, and Wynne Williams has extolled the former agent as useful in cancer of the cervix uteri, but I have no experience of it in cancer of the breast. The potassa cum calce has often been employed in the form of solid stick to cancerous masses. It is an extremely powerful agent, and is apt to "run" so as to affect healthy tissues, unless great care is employed.

The chloride of zinc made into a paste with flour and extract of opium, or cannabis indica, is perhaps the most commonly applied caustic in these cases. Its action is more readily controlled than many destructive agents. Nitric and sulphuric acid are also useful. The latter, mixed with equal parts of charcoal, is a very powerful and manageable escharotic. Mixed with asbestos, it formed the essential of "Michels' paste."

I have seen a 30 per cent resorcin ointment destroy small tubercles of cancer and sarcoma, and the perchloride of iron is a powerful astringent and escharotic.

Owing to the fact that escharotics have from time immemorial been used by quacks and impostors in the most improper manner in the treatment of cancer, there is always a strong opposition to their employment in legitimate practice. This is natural but perhaps not quite logical. "Caustics," writes Bryant, "are, however, useful in open cancerous ulcers that cannot be excised, with the view of checking growth, preventing fœtor, lessening discharge, and diminishing hæmorrhage."[1]

Butlin, writing in vol. xxiii. of the *St. Bartholomew's Hospital Reports*, mentions two cases where he treated open ulcerating cancers of the breast with caustics (Vienna paste), since the patients were old and feeble. The ultimate results were very good, though the constitutional symptoms were severe in one of the cases. He very properly criticises the attitude of the profession towards "caustics" in the treatment of cancer. In another case, the pain induced by the application was so great, that the treatment had to be discontinued.

We have in cocaine a powerful adjunct to the treatment of open ulcerating cancer by caustics. The parts are soaked in a 10 per cent solution, and then nitric acid may be brushed on, or the potassa cum calce applied, or one of the caustic pastes. The process may be repeated a sufficient number of times to entirely destroy the growth.

My personal experience in the treatment of recurrent mammary cancer by caustics has been extremely limited. I have employed it in only two cases. In both of these small nodules of recurrent disease appeared in the scar, in the one case three, in the other five years after the original operation. Removal was effected by cocaine and the sulphuric acid paste, and the wounds cicatrised. Death from general dissemination of the disease ultimately occurred in both instances. The method may be worth remembering in suitable cases, especially for that numerous class of patients who quite refuse cutting operations.

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[1] *Diseases of the Breast*, p. 232.

There is a specimen of a cancerous breast removed by the caustic paste by Fell in the museum of the Middlesex Hospital (XXVII. 2114). Here the patient remained free from disease for over twenty years, when the growth returned in the scar. The favourable results sometimes obtained after the caustic treatment were, no doubt, due to the extreme destruction, especially of the skin over the diseased part.

Injections.—Numerous chemicals have been injected into nodules of cancer. Acetic acid has been used as an injection in cancer of the breast. Bryant[1] mentions a highly successful case. This treatment was first introduced by Broadbent in the year 1866. The acetic acid treatment was tried at St. George's without good result, as the following case will show.

A married woman, aged sixty-five, was admitted under Mr. Lee's care into St. George's Hospital on 6th February 1867. She has had a scirrhous tumour of the right breast for two years and the usual clinical signs being present. The tumour was injected with "acid acet. fort. ʒj.," aq. dist. ʒij. to each injection. This was repeated at intervals seven times. Beyond causing some smarting pain no effect was produced upon the tumour. As regards the injection of aniline blue into malignant tumours, this originated in Germany about the year 1870. I have employed the method in several cases, with no benefit.[2]

Absolute alcohol, solutions of arsenic, and saturated solutions of zinc sulphate or zinc chloride have been injected into nodules of cancer. Such treatment has little to recommend it, and I have no personal experience of its efficacy or otherwise in carcinoma of the mamma.

A good example of alcoholic injections in mammary cancer is given by Yeats of Manchester in the *Brit. Med. Journ.* for September 1897. The patient was a woman, aged fifty-eight, who refused operation for a large ulcerated cancer of the left breast. The mixture used was 40 parts absolute alcohol and 60 of distilled water. Of this, 460 minims were injected into the tissues round the tumour and into the axillary glands. In all, about seventeen injections were given at intervals. They caused œdema and inflammatory reaction, and in the eighth week the tumour began to shrink and went on diminishing until only the nipple and some thickened tissue remained. But then the woman died of carcinoma of the liver secondary to the mammary disease. Sheridan Delépine, who examined the specimen, reported that the mammary tissue showed atrophic carcinoma, but in some parts presents the appearances of a typical "scirrhous carcinoma." The mammary tumour showed marked signs of irritative proliferation of the connective tissue. In commenting upon this case, the reduction of the tumour must be ascribed to inflammatory contraction. We can hardly think that this was curative in the true sense of the word. Indeed, cancer tissue was locally detected, and the growths in the liver show that the ordinary metastatic phenomena were in no way influenced.

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[1] *Diseases of the Breast*, p. 260.

[2] Mosetig Moorhof, *Centralblatt f. Chirurgie*, 1891.

Electrolysis.—Destruction of nodules of cancer, especially recurrent cancer of the breast, have been effected by electrolysis. The process is a combination of actual burning, and decomposition and disintegration of the cellular elements by chemical changes. Beyond the mystery that attaches to the mind of the ignorant in being treated by any electrical methods, I cannot see that electrolysis has any marked advantages over such modes as the actual cautery, excision, or caustics. "Cures" of cancer by electrolysis will be found reported in many of the books on electrical treatment, but a close study will usually reveal some weak point in the history of the cases related. At the same time the method is a perfectly justifiable one to use on nodules of recurrent cancer.[1]

Electricity.—From time to time this agent has been used in treatment of cancer, sometimes by charlatans, at other times with genuine hopes and beliefs in its efficacy. Those who wish for a detailed account of the methods may consult Dr. Inglis Parsons' paper in the *British Medical Journal* for 1889. He assumes that as the vitality of cancer cells is lower than that of the other tissues, it may be possible to destroy them by the passage of a powerful voltaic interrupted current through the growth, which is said to shrivel into an inert and fibrous mass. Sufficient cases treated by this method have not been reported to enable one to pronounce a definite opinion upon its value or demerits. The theoretical objection which at once strikes the reader, is the impossibility of thus affecting the scattered groups of infective cells, which are disseminated at a distance from the primary focus. At present I should not advise this treatment in early carcinoma, but it is at least as good as many of the "partial" operations too often performed by those who lack surgical experience.[1]

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[1] Lewis Jones and Steavenson's *Medical Electricity*, p. 42.

I am not aware who first made the observation that ulcerating malignant growths improved after attacks of erysipelas,[2] but this clinical hint has been followed up by inoculating patients with cultures of the streptococcus pyogenes. This was done by Zehluson in 1883, by Bruns in 1888, and by Coley in 1891. As there seemed no control over the danger and severity of the septic symptoms thus created, it was next suggested that the toxins of the streptococcus should be employed instead of pure cultures (Lassar, Spronk, and Coley). Coley added the toxins of the bacillus prodigiosus to the toxins of erysipelas. The toxins are to be injected into the tumour itself or into a distant part. The tumours inflame and necrose. The general symptoms of fever and malaise are exceedingly severe.

Schott inoculated a burn with virulent streptococcus cultures. The animal was killed by bleeding, and the blood filtered through porcelain. The serum thus produced was injected in doses of $\frac{1}{2}$ to 20 c.c. The constitutional symptoms were said to be slight, but the results were poor on the growths.

I am indebted for much information regarding these experiments to my colleague Dr. Slater, bacteriologist to St.

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[1] It has been often said there is nothing new in medicine or surgery, and it is interesting to observe that as long ago as the seventeenth century Dr. Eaton, a physician of Dublin, relates the case of a Mrs. Wynne who was affected with a tumour of the breast which disappeared after she had been "struck by lightning" with sufficient severity to burn her clothes and throw her to the ground. In commenting upon this case the author observes, "Should we not be encouraged to try this electric shock against indurated swellings in glands!" (*Ed. Med. Commentaries*, vol. iv. p. 82).

[2] Mr. Butlin says that Busch of Bonn first discovered this fact in 1866 (*Clinical Journal*, 29th January 1896). Ricord in 1882 attempted inoculation of pure erysipelas.

George's Hospital, who thus sums up the attempts to cure malignant disease by inoculations.[1]

(*a*) Injection with the virulent organism.

Apparently effective, but certainly dangerous.

(*b*) Treatment with toxins.

Occasionally successful, but gives rise to severe symptoms.

(*c*) Treatment with the toxic blood serum of an infected animal.

Of doubtful efficacy, but gives rise to less constitutional disturbance.

(*d*) Treatment with antitoxic serum.

Free from risk, but apparently ineffective.

Speaking generally, it may be said that the method (*a*) has given the most striking results, and that undoubted cases of cure of sarcoma are reported by Coley.[2] The results upon carcinoma are poor, but in cases of recurrent sarcoma of the breast unfit for operation the method is well worth a careful trial. It is of necessity dangerous.

In a Clinical Lecture[3] Butlin gives his experiences of Coley's methods. The fluid was injected in doses of two to four minims, and it caused severe and characteristic reactions, the temperature rising to 103 or 104°. This surgeon negatives the use of this method in carcinoma, but thinks it worthy of trial in sarcoma, beginning with the minimum doses. An excellent account of the general estimation and limits of the seropathy of malignant disease in 1895, will be found by Repin[4] entitled the "Toxitherapy of malignant tumours." He refers to the experiments of Lassar and Spronk, and speaks of the efficacy of the treatment in sarcoma. Senn[5] reports nine cases of failure, and says that the method is of no value, and that it will be in the future assigned to the list of obsolete remedies.

In March 1897, Dr. Coley wrote in the *British Medical Journal* to the effect that the principal utility of his fluid was to be expected in cases of sarcoma of the spindle-celled variety. He was not obviously a strong advocate for its use in carcinoma.

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[1] *St. George's Hospital Student's Gazette*, 2nd March 1896.

[2] *American Medical Record*, 19th January and 10th May 1895.

[3] *Clin. Journ.* 29th January 1896.

[4] *Revue de Chirurgie*, June 1895.

[5] *Journal Amer. Med. Assoc.* 27th July 1895.

At the present time (1896) most surgeons regard seropathy of cancer with disfavour, and reserve it for cases of sarcoma hopeless for operation. The case of recurrent "myeloid" disease of the breast mentioned on p. 280 was treated by injections of Coley's fluid obtained from trustworthy sources. The injections were followed by smart reaction, with fever and a sensation of "numbness" down the limbs. A faint roseate blush spread over the nodules and round them. In about ten days two of the masses the size of a walnut, began to rapidly shrink, and they practically completely disappeared. There could be no doubt of the action of the fluid in this case. A mass under the pectorals was now injected, but hyperpyrexia set in, and the patient died of pyæmia, with multiple abscess, containing the staphylococcus aureus. The fluid was found to be sterile. A patient with carcinoma was injected on the same day, with the same fluid, with only transient disturbance. The remains of the neoplasms which had shrunken away, were found suppurating and disintegrating, and containing the staphylococcus aureus in abundance. It seems likely that organisms had gained entrance from the skin along the punctures into the disintegrating growth. The impression left on my mind in this case was, that the fluid acted purely as an inflammatory agent. The case was a very hopeless one, and the patient could not long have survived, but the case affords a striking proof of the danger as well as the benefits that attend methods of treatment by powerful toxic agents. The shrinkage of the growths made a very strong impression on my mind, and I certainly think the method worthy of trial in hopeless cases of sarcoma. I believe the flaw in this case was inefficient disinfection of the skin, permitting organisms to gain access to the inflamed and necrosing neoplasm.[1]

In the year 1896 Beatson of Glasgow practised removal of the ovaries and tubes in cases of inoperable cancer in the hope that growth might be averted. He cites one remarkable case where a breast was removed for scirrhus, and recurrence of an extensive nature took place on the scar. The ovaries and tubes were removed, and thyroid treatment adopted. The cancerous tissue got yellow and fatty and ultimately disappeared. In some other cases, the method seemed to influence the growth very little, and it is obvious that it is only too likely to be abused. In cases of recurrent cancer in young women it may legitimately after consultation have a trial, and may perhaps prove of utility especially in relieving pain. Mr. Stanley Boyd refers to two cases where he removed the ovaries in women aged forty-five and thirty-eight, who were suffering from recurrent cancer. Diminution of pain and shrinkage of the growth were very marked.[1] One fears in many of these cases the growth may again appear, the improvement being only temporary. They need further watching.[2]

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[1] For a paper by myself and comments by Butlin upon this case, see *Brit. Med. Journ.* for January 1897.

Medical Treatment of Cases beyond Operation.—Every practitioner of experience knows that a considerable proportion of his cases come under this category, and it needs all his care and acumen to satisfactorily manage illnesses so sad and trying to all concerned. When recurrence takes place after operation, I would impress most earnestly upon my readers not to take a hopeless view of the situation, but to encourage the patient to hope, and to fight against the disease by repeated operations if feasible, or by some of the other modes of treatment indicated. The sentence, "I can do nothing more for you," it is not surprising to learn, drives these unhappy persons to irregular practitioners, who, by some method or another, give them that hope and benefit which should have been received from the regular attendant.

The time will, however, come in a certain number of cases of carcinoma of the breast, when operative treatment is no longer of avail, and the patients having likely enough tried, in turn, every kind of imposture and quackery, so easily to be obtained in this country by the victims of incurable disease, will once more turn for aid to the medical attendant. In such cases an immense amount of good can be done in relieving the anguish of the disease, and affording suitable dressings and nursing. The services of trained nurses should, if possible, be insisted upon, the efforts of ignorant but well-meaning relatives being quite inadequate to cope with these most trying cases, towards their termination. Good nursing and attendance are essential in cases of incurable breast cancer, and I have no doubt whatever, that a diet of milk and fish is far the best for these cases, with an almost total absence of meat or stimulants. Some of the symptoms like relief of pain, arrest or diminution of growth, which follow the application of " quack " remedies, are really due to the careful dietary insisted upon during their administration. Stimulants and meat increase the growth, and often the pains, of cancer.

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[1] *Clin. Journ.* 2nd June 1897.

[2] I have heard of at least one case where removal of ovaries did not benefit the condition of the cancer in the least. Such occurrences are never published!

Anodynes.—Opium and its derivatives stand first upon the list, and I doubt whether anything really avails to assuage the pains of cancer, like the hypodermic injection of morphia, especially when combined with atropine. The dose has gradually to be increased, until enormous quantities are borne. I have known these patients finally take as much as twenty grains of morphia subcutaneously, without showing symptoms of poisoning. Such doses are only led up to slowly, by gradual increase. In the earlier stages anodynes are often given by the mouth, and such drugs as sulphonal, or the bromides may be effectual, but not for long. The digestive disturbance and serious moral deterioration produced by large doses of morphia are very marked, and while allowing that this drug must be used in cases of great pain, the medical attendant must do his utmost to fight against its administration, and only resort to it in cases of the utmost need. I am strongly against the immediate inculcation of the morphia habit in these cases. Of local anodyne remedies we have a considerable list and these we should especially employ. A most valuable remedy, but yet uncertain in its action, is a solution of citric acid[1] in the proportions of a couple of drachms to eight ounces of water. A strong solution of hydrate of chloral is also a very useful remedy. I have also found the greatest benefit from conium. I believe this drug to be devoid of any curative effect whatever, but its action as an anodyne to an ulcerated cancer is very marked. A warm poultice made of the fresh leaves is the best application. When these cannot be obtained, the freshly prepared succus mixed with equal parts of lanoline may be applied. All local anodynes may be mixed with antiseptic or deodorising agents. Cocaine ointments of the strength of 10 or 20 per cent are also of utility, and may be mixed with deodorising or antiseptic substances. Sometimes the ice-bag has a very marked and beneficial effect, and may be constantly applied.

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[1] Barclay, *Brit. Med. Journ.* 1866, vol. i. p. 407.

Local Deodorising and Antiseptic Remedies.—The importance of clearing away sloughs by caustic agents and the gum resins has already been dwelt upon, and it follows that the cleaner the surface of a cancerous ulcer can be kept, the less annoyance and deterioration of health will the patient suffer from fœtor and discharge. About once a week, the surface being cocainised, the whole ulcer may be lightly painted over with pure carbolic acid. Iodoform dressings are generally objected to, because of their smell, but an excellent powder for these purposes is composed of equal parts of finely powdered iodoform, and Tonquin bean, to which a small proportion of morphia can be added. Sulphurous acid (1 in 40), a ten vol. solution of hydrogen peroxide, or the liq. sodæ chlorinatæ in the proportion of a drachm to the pint, are all useful applications. It will generally be found, that after the wound is washed with some of the above, a "dry dressing" is very efficacious. These patients usually soon get sickened in my experience by any marked scent or odour, and hence the local application should be frequently changed. The various medicated wools, especially wood-wool, boric wool, and mercuric blue wool, are especially useful for soaking up, and lessening the annoyances of discharges.

The application of oxygen gas to the surface of a cancerous ulcer, is undoubtedly efficacious in destroying discharge and fœtor, but the apparatus is rather costly, and the application seems not superior to more simple remedies.

Hæmorrhage.—Bleeding is not uncommon from cancerous ulcers: it may usually be checked by the application of a morsel of wool or lint, steeped in turpentine, or the liquor ferri perchloridi and firmly pressed upon the bleeding spot, to which it adheres. I have never known recurrent cancer of the axilla to ulcerate into the axillary vessels, though such a contingency is not impossible. In such a case the question of amputation would arise.

The practitioner has already been cautioned against giving too definite prognosis, in cases of cancer beyond operative treatment.

APPENDIX

DISEASES OF THE MALE BREAST

Diseases of male mamma merely differ from female in order of frequency—Proportions of frequency of tumours—Statistics of Schuchardt—Chloroma of male mamma—Mastitis and abscess—Chronic mastitis and syphilis—Fibro-adenoma and fibroma—Innocent tumours as lipoma, cysts, and enchondroma—Suppuration of male mamma—Melanosis of skin—Cancer of the male mamma.

The diseases of the male mamma are neither numerous nor peculiar to the sex. They imitate similar affections in the female, and much that has been said regarding maladies of the female breast applies to the male. The main difference is merely in frequency.

R. Williams comes to the following conclusion. Speaking in general terms, 1 case of benign tumour of the breast is found in males to 116 in females, and 1 case of carcinoma to 102 in the female. Paget estimated that the proportion of carcinoma of the male breast was about 1 per cent. Out of 95 cases of tumours spoken of as chronic mammary, which occurred at St. George's Hospital between 1875 and 1895, five were found in the male, and from their description they appear to have been true fibro-adenomata. In the same period the proportion of cases of carcinoma of the male mamma was a little below 1 per cent.

In a laborious compilation of the literature of neoplasms of the male breast by Schuchardt,[1] the author concludes that about 2 per cent of all cancers occur in the male. Milton in 1857 found 40 cases of cancer. Wagstaffe in 1876, 21 more.

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[1] See *Annals of Surgery*, 1885, i. 71.

Poirer in 1883, 62 cases of carcinoma, sarcoma, and tubercle. Schuchardt describes 172 neoplasms, and mentions about 100 more. Of the 172 described cases, there were 1 enchondroma; 1 cutaneous deposit; 2 adenomata; 3 fibroma; 1 myoma; 15 cystic; 2 tubercular. The remainder were of the nature of carcinoma. From this extensive research it is obvious that the various tumours of the female breast find their counterpart in the male, and that carcinoma is the most common. My own researches seem to show, that fibro-adenoma is more common in the male mamma than cancer. The same author writes of syphiloma affecting the breast as well as congenital and acquired enlargements. The ages of 89 of Schuchardt's cases of carcinoma are thus given.

None were under twenty years, one occurred at the age of eighty-four.

Between 20	and	29	years	there occurred	3	cases.
30	,,	39	,,	,,	8	,,
40	,,	49	,,	,,	26	,,
50	,,	59	,,	,,	27	,,
60	,,	69	,,	,,	16	,,
70	,,	79	,,	,,	9	,,
					89	

Mr. Nathan Jacobson of Syracuse, has recently observed the following interesting series of neoplasms of the male breast.

(1) Epithelioma of the nipple in a man aged seventy.

(2) Sarcoma of the spindle-celled variety in a man aged seventy-three.

(3) A fibro-adenoma in a man aged fifty-three.

He has found a number of recorded cases of true epithelioma in the male commencing in the nipple and invading the axillary glands.[1]

The rarity of all diseases of the male mamma as compared with the female is dwelt upon. The author considers about 2 per cent is the proportion.

It is worthy of mention that the rare tumour growth, known as chloroma, has occurred in the male mamma.

Laurence[2] relates the case of a "malignant growth" in the breast of an Italian, aged thirty-five. Here the tumour and secondary deposits in the axilla and viscera were of a deep green colour. The subcutaneous tissue and pleura were also of a grass-green hue.

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[1] *Medical News*, 30th January 1897.

[2] *Med.-Chir. Trans.* vol. iii.

So far as I know, this case is unique of the disease in the breast. A specimen is referred to in the museum of St. Bartholomew's Hospital of round-celled sarcoma in a boy aged ten, who also had orbital growths and tumours of the skull, all being of a bright green colour.[1] In the *American Journal of Medical Sciences* for 1895, Schmidt reports a case from the Pathological Institute of Göttingen, where a female of twenty had axillary and supraclavicular tumours, which proved after death to be sarcomata of a bright green colour. No micro-organisms could be detected in the grass-green cells.

A perusal of this short chapter will show the reader that inflammatory complications and abscess, with the various kinds of cysts, are all occasionally found in the male breast, and their treatment presents nothing unusual or peculiar. The subjects of hypertrophy and atrophy have been alluded to in the first chapter.

Acute Mastitis and Abscess.—The causation and pathology of these affections in the male are much the same as in the other sex. Engorgements and abrasions in connection with lactation being absent, the affection is correspondingly rare. Abscess or acute mastitis is sometimes found in male infants, and in boys towards the period of puberty, but one of the most important causes of abscess of the male breast is certainly a blow, organisms gaining access to the site of injury by way of the ruptured or injured ducts.

The infrequency of mammary abscess in the male sex may be estimated from the fact that out of 200 cases admitted into St. George's Hospital only two occurred in males. One of these was pyæmic, the other was directly attributable to a blow. Bryant[2] relates two cases of mammary abscess in the male, occurring in the person of a "lighterman" and a smith, who might be supposed likely to suffer from injuries. Velpeau[3] cites an instance, where abscess followed a blow from a ball upon the breast-plate of one of the municipal guard. The same author draws attention to the important fact, that abscess in the male breast may be associated with necrosis of a rib, or even with spinal caries. He cites a remarkable case of the latter affection, when the matter obviously "tracked round" to the neighbourhood of the mamma.

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[1] *St. Bartholomew's Hospital Reports*, vol. xxv. p. 319.

[2] *Diseases of the Breast*, p. 54.

[3] Velpeau, *Diseases of the Breast*, Part II. p. 38.

The following case will illustrate the rare and exceptional condition of pyæmic abscess in the male mamma.

A feeble and exhausted labourer, slightly jaundiced, dull, heavy, and extremely ill, was admitted into St. George's Hospital in July 1884. He was unable to give a very rational account of himself, but his wife stated he had been "ill all over" for more than ten weeks. He had been engaged about drains, and one of his fellow-workmen had been similarly affected. There was a large foul abscess in the left mamma, which apparently had existed for about five weeks, commencing as a painful swelling, getting larger and larger. There was also a tender puffy tumefaction about the right lower malleolus, but on incising this no pus escaped. The man's temperature was high, and his tongue dry and foul. Pus exuded from the wound near the ankle the next day. This patient remained in the hospital for upwards of ten months, having a hard struggle for his life. Other abscesses formed in the buttock and right sterno-clavicular articulation. He ultimately recovered. The abscess in the mamma was obviously only part of a general pyæmic attack.

As in the female, on rare occasions carcinoma may be associated with suppuration in the male mamma. Either a carcinomatous cyst may suppurate, or an infective abscess occur near an ulcerating cancer, or as in the present case, carcinoma may seem to originate in an abscess wall.

A hard painless lobulated swelling was noticed in the right mamma of a male lunatic aged forty-nine. An incision evacuated about eight or ten ounces of sanious pus. The wound never healed, and a mass of carcinoma made itself obvious, for which the whole mamma was removed. The patient tore off his dressings, but ultimately recovered.[1]

As in the female it is often difficult or impossible to assign a cause for abscess in the male mamma.

A labourer, aged twenty-six, was admitted into St. George's Hospital in November 1877. For two months he had suffered from a painful swelling of the right breast just internal to the nipple. He knew of no cause. The swelling was described as the size of half an apple. An incision was made and pus discovered. The future course of the case was very tedious, several "counter-openings" having to be made.

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[1] *Lancet*, 6th September 1879, p. 353.

A man, aged sixty, was in St. George's Hospital on 19th July 1872, under the care of Mr. Holmes. He had a large abscess on the front of the chest, below the right pectoral, and extending on to the front of the sternum.

Eight ounces of pus were evacuated by the aspirator, and careful examination quite failed to elicit any distinct cause for the mischief. There was no intrathoracic mischief, but a special note is made that the patient complained of severe pain in the back.

Tubercle may be a cause of abscess in the male breast.

A labourer, aged thirty-one, six months before admission to Westminster Hospital on 20th September 1893, noticed a lump in the left breast. No pain or discharge from nipple. No history of syphilis, but says he was struck with an iron bar on the part a year previously. The tumour is described as forming an indolent lump, movable, not affecting the skin. There was slight glandular enlargement in the axilla. Mr. Macnamara cut a "considerable portion" of the tumour out, but did not touch the axillary gland. The wound healed rapidly, and microscopic examination proved the case to be tubercular. The further history of the case is not given, nor any reason for the incompleteness of the operation.[1]

The following case points very strongly to the possibility of abscess of the male breast, at all events, being caused by local pus infection, the organisms probably entering by some minute abrasion.

An unhealthy-looking man, aged thirty, attended the out-patient department of St. George's Hospital in June 1896. For three months he had crops of "boils" about the body, and a fortnight before attendance a large pustular sore formed on the chest in the mid-sternal region. For a week the right mamma had been swollen and painful, and a lump the size of a walnut formed in it, with much local tenderness and redness. This was opened by the assistant house-surgeon on 29th June. About half an ounce of thick pus escaped from a cavity deep in the mammary substance, and the parts soon healed. There was no evidence of gummatous formation in this case, and the possibility of pyogenic organisms having gained access by the nipple must not be ignored.

An exactly similar case came under my care in March 1897, at St. George's Hospital. In a man about thirty-five, an abscess formed in the areola the size of a large nut, it had a central slough, and a yellow centre, and was very suggestive of a large "boil" forming connection with one of the sebaceous glands so abundant in this region.

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[1] *Westminster Hospital Reports*, 1893, p. 169.

Abscess of the male breast may become chronic, and may simulate a solid growth, as in the female. The same caution must be employed in making exploratory incisions in these cases for purposes of diagnosis.

Treatment.—The treatment of acute mastitis and abscess in the male presents nothing peculiar, and can be managed on general principles. There is the same reason for draining in a dependent position, as was insisted upon in the female. The resulting sinus being very near the pectoral fascia, the arm should be confined during the healing process.

Chronic Mastitis.—The causes of chronic induration and inflammation of the male breast are often obscure. A certain number follow blows or other injuries, or such abiding sources of irritation as the pressure of a shoemaker's last. A few may be gouty in origin, probably more are due to the syphilitic virus than is generally believed.

A ship's steward, aged twenty, came to the out-patient department of St. George's Hospital in 1895. Two years before, he had received a severe blow upon the left mamma. Six months after, the gland commenced to enlarge with severe pain. The breast was enlarged to double its size. It was hard and indurated, and severe sickening pain was experienced on pressure. There was no history of syphilis. I placed the man upon "iodides" and applied a mercurial plaster with such graduated pressure as he could bear. He twice attended, and the swelling much diminished in size. I do not know the end of the case.

Some cases in our museums termed hypertrophy of the male mamma, are likely enough chronic inflammation.

Specimen 1952 in the museum of University College Hospital shows a male breast with the nipple and surrounding skin removed for disease. The nipple and skin are unaltered. The mass removed is circular and three inches in diameter, but not more than half an inch in thickness. There is little fat, the mass seeming to be composed chiefly of excessively dense fibroid tissue.

Under the microscope the growth is formed of white fibrous tissue, perfectly developed, containing few cellular elements. Scattered through this are numerous spaces reaching about $\frac{1}{200}$ inch in diameter, lined with a small cubical epithelium. Most of these spaces are rounded in form; a few are long, resembling ducts cut longitudinally. The disease seems to be a hypertrophy of the male gland, with great overgrowth of the fibrous tissue.

Hutchinson illustrates the occurrence of syphilitic mastitis as follows:—"In this instance a recent syphilis was of only eighteen months' duration. The left mammary gland became enlarged in all dimensions, hard and painful—it was as large as the half of a small orange; its margins could always be quite easily traced, and no suppuration was ever threatened. In spite of mercurial treatment under which other secondary syphilitic symptoms yielded, the breast remained large for several months. Finally it became reduced to its normal dimensions under iodide of potassium.

"It was probable in this case that the patient's syphilis was a second attack. He had been treated for a chancre some years previously. The enlargement of the breast undoubtedly occurred amongst secondary phenomena which were due to a recent infection, but it may still have been due to the old disease, and therefore of the tertiary class. Only one gland was affected, and the difference in results from mercury and iodides was most definite."[1]

In connection with syphilis of the male mamma it has been pointed out, that syphilitic chancres of the nipple or areola are exceedingly rare in the male.

A man, aged sixty-three, came to Mr. Hérard in December 1865, with a small indurated sore at the base of the left nipple. A few days later the induration affected the whole base of the nipple, and there was an area of redness extending from it to the axilla where a swollen gland could be felt. There was no lesion on the penis or elsewhere. Mercury was prescribed. Early in January roseola appeared, and was soon followed by a confluent papulo-scaly eruption. At the end of January the initial lesion had healed, the induration had nearly disappeared, and the eruption was fading. The history the patient gave was, that the nipple had been sucked by a woman on 16th November.[2]

Treatment.—In the treatment of chronic mastitis, iodides, mercury, and pressure are all indicated. In obstinate cases, causing much local trouble, there would be no reason against excision of the gland. Indeed, there is obviously less objection to this treatment in the male than in the female.

The following cases illustrate the fibro-adenomatous

[1] *Archives of Surgery*, April 1894.

[2] *London Medical Recorder*, 15th July 1887.

tumour of the male mamma, which is the most common benign growth of the organ. The symptoms, as mobility, chronicity, firmness, and lobulation, are exactly similar as in the case of the female. Cystic changes may also occur. There is no essential pathological distinction in the growth in the two sexes.

A healthy man, aged thirty-five, was admitted into St. George's Hospital, on 13th February 1889. He had noticed an enlargement of the left breast for six months, with pains of a "rheumatic" nature. There was a nodular tumour in the breast, freely movable, with the skin not involved, and the nipple not retracted. There was no glandular implication. The tumour was readily shelled out through an elliptical incision, and was pronounced by Professor Sheridan Delépine to be a fibro-adenoma clear of carcinomatous structure.

A man, aged thirty-four, had a tumour the size of a small walnut in the left breast of four months' duration. On removal it presented on section a bare whitish surface. Under the microscope the tumour was fibrous towards the centre, but at the periphery was more embryonic in character. No trace of gland structure was to be seen throughout the tumour. This case is recorded by Beadles in vol. xliv. of the *Path. Soc. Trans.*

A case of pure fibroma from the male breast is related in the *Lancet* for 13th August 1892 by Dr. Munro. A labourer, aged twenty-seven, had a tumour in the right breast close to the nipple, following a kick received twelve months before. Six months after, the tumour appeared. "It was circular, the size of a crown piece, the nipple being over the centre of it. It was firm even to hardness, movable under the skin, and felt like a lobulated portion of mammary gland." Professor Greenfield of Edinburgh reported, that the tumour was composed of fibrous tissue with scattered remains of acini.

In some of these cases distinct histories of injury may be noticed.

A "rough rider," aged fifty, was admitted into St. George's Hospital in October 1888 with a tumour of the left breast. He had a severe kick upon the gland four years previously, for which he had attended some time as an out-patient. He has noticed the present tumour for four months. On examination a hard movable tumour was found just behind the nipple, which was free of it and not retracted. On removal it was examined by Professor Delépine, who reported the neoplasm to be a typical fibro-adenoma, with the glandular structure well marked, and in many places a tendency to papilliferous arrangement. In conjunction with this case it may be mentioned that there is a specimen in the museum of Charing Cross from the breast of a healthy young man in the navy, which followed a blow from a spar.

Sarcomatous change may supervene in these tumours. Long quiescent they may take on rapid growth, an urgent reason for their timely removal. Keetley reported such a tumour of the male breast at a meeting of the West London Medico-Chirurgical Society in April 1897. The patient, aged thirty-four, had noticed the growth twelve years before. It long remained no larger than a bean or nut, but in twelve months grew much faster until it reached the size of a hen's egg. Microscopically the tumour was an "adenoma," but Mr. Keetley suspected that some softer parts had taken on a sarcomatous change.

As in the female, fibrous or sarcomatous tumours may form near the male mamma and displace or infiltrate it, simulating a growth of the gland itself.

An ill-nourished, sallow man, aged twenty-two, had a tumour in the left mammary region of gradual formation, and without any ascertainable cause. It was egg-shaped, following the line of the pectoral muscle, wide at its base, and rising into an oval prominence in front upon which the nipple was placed. The axillary glands were enlarged, and a cord-like prolongation stretched from the tumour towards them. There was no history of syphilis. The tumour was of "stony hardness" and quite fixed to the muscle. The age of the patient, the absence of skin implication or of nipple retraction, led the surgeons of St. Bartholomew's to believe the growth not to be carcinomatous. Their opinions were correct. On examination it proved to be composed of dense fibrous tissue. It had originated in the pectoral, and the mammary gland was displaced in front of it. The similarity to carcinoma was obviously very close.[1]

Innocent Tumours of Fat, Cartilage, etc.—Following the analogy between the male and female breast, it may be pointed out that such tumours as lipomata may grow near and displace the male mamma. The gland and nipple may almost invariably be saved, and the incisions for removal of the mass should not include the whole gland or the nipple.

A lad, aged sixteen, was admitted into St. George's Hospital on 5th November 1884. "His right breast has been swollen as long as he can remember." It slowly increases in size, yet gives him no pain. The gland was swollen and round like that of a young woman. It was soft and fluctuating. There was no implication or discoloration of the skin. The mass was removed, and on dissection it was found to consist of a soft, fatty tumour, having the unaltered, healthy mammary gland in front of it.

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[1] Savory, *Med. Times and Gazette*, 13th May 1865.

In November 1882 Mr. Haward removed a fatty tumour from just above the left breast of a cabman aged thirty-nine, who had a similar growth in the pectoral. The tumour on the front of the chest is described as being as large as the palm of the hand. The breast-tissue was displaced by it, and it appeared in no way to implicate the mammary substance proper. A somewhat similar fatty tumour, as "large as a female breast," is described by Maunder as growing in the axilla of a man aged fifty-seven. It passed behind the pectoral.[1]

Cysts.—The classification of cysts in the male may be conducted on the same lines as in the female. These cysts may form in tumours, innocent or malignant, or by duct obstruction, or in connective tissue spaces. Sebaceous cysts may form in the skin, or hydatids in the submammary pectoral region. Cysts of the male breast are of course very uncommon as compared with similar formations in the female. Birkett mentions a sebaceous cyst occurring near the nipple, the bluish tinge of which raised a suspicion of cancer.[2]

A cyst of the male breast the size of an orange was removed at the London Hospital in 1861 (*Lancet*, 23rd November 1861). In the College of Surgeons' Museum a cyst of the male breast is preserved which is double, each cyst being of large size (4752 A).

A cabman, aged forty, was admitted into St. George's Hospital on 14th June 1896. For three years he had noticed a small lump in the right breast, which has not markedly increased in size. There was a tumour the size of a walnut in the right breast. It was not very hard, slightly lobulated, and freely movable under the skin. The tumour was removed, and turned out to be a simple serous cyst.

Papillomatous formations may occur in the cysts of the male mamma. If the epithelium infiltrates the cyst walls, and proliferates in the mammary tissue, the villous variety of duct cancer occurs.

Thus at a meeting of the New York Surgical Society for 25th October 1893, Dr. F. W. Kammerer showed a tumour composed of two cysts, which he had removed from a man forty-five years of age. The cysts contained bloody serum and papillomatous growths, evidently malignant.

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[1] *Path. Soc. Trans.* vol. xxvii. p. 251.

[2] Holmes, *System of Surgery*, vol. iii. p. 460.

A man was operated upon in the London Hospital in October 1861, by the late Mr. Gowland. He was sixty-one years of age, and had a tumour the size of an orange in the breast. The growth was a cyst, and could be emptied by pressure. Fluid resembling pale ale would spurt out through the nipple. It had existed for nine years (*Lancet*, 23rd November 1861).

A patient, aged forty-four, had noticed a swelling in the left breast for six weeks. It had steadily increased, and was very painful. There was a hard, movable tumour in the upper part of the breast. The skin, nipple, and axillary glands were not affected. A surgeon removed the whole mamma, but the tumour turned out to be a simple cyst with thick walls. The case was operated upon at a London Hospital in 1890.

A shoemaker, aged forty-eight, was admitted into St. George's Hospital in September 1882. He has had a swelling in the left mamma for two years, it had increased lately, with pain. Nine weeks before admission, he accidentally struck the swelling, which since then has increased rapidly. The left mamma was enlarged to the size of "the breast of a girl eighteen years old." At one spot just below the nipple there was a rounded projection, which gave the sensation of fluctuation. A syringe withdrew clear fluid, and ultimately a cystic cavity was opened and drained. The cyst was said to contain a clear "jelly-like" fluid. The case did not do well, and the sinus long suppurated, but it seemed to be healing when the patient left for the Convalescent Hospital at Wimbledon. Some chronic pleurisy had also supervened.

Any cyst of the male breast may suppurate. In the following, hydatid origin was suspected, though, on perusing the case, the evidence is not perfectly clear.

A man aged twenty-six was admitted into St. George's Hospital on 20th February 1872. He had noticed a tumour the size of a hen's egg in the left breast for six months. The tumour was firm in consistence, and movable. The axillary glands were not affected. Mr. Pollock removed the tumour, which seemed to be situated in the pectoral muscle, rather than in the breast proper. It was a suppurating, multilocular cyst, and was pronounced to be hydatid in origin.

Mr. Lane operated upon a case in St. Mary's Hospital on 13th January 1858. The affection simulated a hard cancerous tumour in the mamma of a young man. On exploratory section pus was found, and the case was found to be a cyst, suppurating, with the contents gelatinous in nature.[1]

Sarcoma.—Sarcomatous growths may of course be found in the male mamma. They are usually of the spindle-celled variety.

An example is recorded by Croft in the *Path. Soc. Trans.* vol. xxvii. p. 249 (museum of St. Thomas's Hospital, 2536). Here the tumour grew rapidly in the right mamma of a cabman aged fifty-two. The diagnosis was uncertain, but the malignant characters of the tumour were marked. Under the microscope the tumours showed the characters of spindle-celled sarcoma.

In the *Path. Soc. Trans.* (vol. xi.) is related the case of a soldier aged forty, who had a tumour the size of a walnut close to the right nipple. He had noticed it for twenty-one years, and it had commenced as small as a pea. It was described as dense, but resilient and pinkish, being covered with dilated veins, not adherent to the tissues beneath. Mr. Hutchinson pronounced it to be a "fibro-nucleated tumour."

A remarkable case of sarcoma of the mammary region is reported by Banks (*Clinical Notes*, 1884, p. 69). The patient was a young man of twenty. The tumour formed a huge bleeding mass on the edge of the pectoral. It appeared to originate either in a gland below the muscle or in an accessory mamma. It can, however, hardly be considered as an instance of sarcoma of the breast proper.

Similarly, sarcomatous growths may originate in the skin over the male breast. A "mole" in this situation may readily degenerate into melanotic disease.

Mr. Keetley has sent me particulars of a case of sarcoma of the skin over the male mamma. The tumour was the size of a small orange, "red and weeping." It seemed to grow from the skin above the nipple, and the main bulk of the tumour was above the skin. The patient was fifty-five years of age, and the growth of several years' duration. Dr. Abrahams examined the specimen, and believed it to be spindle-celled sarcoma.

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[1] *Lancet*, 6th March 1858

A plasterer, aged thirty, had a mole on the right breast near the nipple all his life. Lately he has pulled it about and made it bleed. It then became larger, and would not heal. The tumour is described as the size of a small orange, and composed of exuberant granulations, but freely movable on the skin below. Mr. Pollock removed the tumour in St. George's Hospital in the year 1876. Unfortunately no after-account of the case is given, and the microscopical characters of the tumour are not detailed, but the similarity to melanosis is very striking.[1]

A fungating melanotic sarcoma on the skin of the male breast is related by Butlin in the *Clinical Journal* for 3rd June 1896. The patient was a man aged forty. He found that the skin over the breast was bluish in colour, and that it "itched very much." Finally ulceration was observed. The axillary and supraclavicular glands became enlarged, and some bluish nodules appeared in the skin near the umbilicus.

Carcinoma.—The usual cancer of the male breast is hard spheroidal-celled carcinoma of the acinous type. Malignant dermatitis may be a precursor of the disease, as shown in a specimen in the museum of the Royal College of Surgeons (4802). In other cases blows are found to be distinctly exciting causes. The symptoms and course are precisely similar to what is found in the female, and the pathology is identical; the only essential difference is the marked comparative infrequency.

The degenerations of carcinoma in the male are similar to what has been described in the female. Large blood-cysts are met with, and in these instances the probability of the growths being of the "villous duct cancer" type is not to be lost sight of. Wagstaffe's extensive tables show us that the majority of cases occur after forty. The youngest was twenty-five, the oldest eighty-four years of age.[1]

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[1] These bleeding warts are said to be identical in some cases with the warts of horses common after castration (champignons de castration). The name Botryomycosis is given to this affection, and an organism has been cultivated and described (MM. Poncet et L. Dor, *Lyon Médical*, 24th October 1897).

A remarkable carcinomatous tumour from the breast of a male aged sixty was recorded by the late Mr. Wood.[2] At some parts the structure was that of spheroidal carcinoma, at others there were cystic formations, filled with villous prominences, which tended to coalesce. One large cavity was filled with altered blood. In connection with this case it may be mentioned that there is a specimen in the museum of the Westminster Hospital, where a carcinoma of the male mamma contains a blood-cyst as large as an orange, and a specimen in St. Thomas's Museum (2538) illustrates carcinoma of the columnar type, associated with discharge from the male nipple. Further investigations will probably show, that columnar carcinoma is more common in the male, than has been hitherto thought.

The following three cases will well illustrate the formation of carcinoma in the male breast following an injury.

A police constable, aged fifty, while arresting a prisoner received a kick on the left breast, causing a bruise round the nipple. Ten weeks after, some hardness appeared, which steadily increased. Rather more than a year after, he entered hospital with a malignant tumour the size of a fœtal head growing in the part. The skin was dusky and adherent, and there were two enlarged axillary glands.[3]

A silversmith who suffered from carcinoma of the breast, attributes the growth to the pressure exercised by the exigencies of his trade upon the mammary region.[4]

A brassfinisher, aged fifty-eight, suffered from carcinoma just below the left nipple. This was the situation where for many years pressure had been applied in his daily work.[5]

Mr. Cæsar Hawkins, in remarking upon a case of this disease in a patient aged sixty-five, draws attention to the fact that he had received a blow from a stone on the breast during an election.[6]

The following case is very remarkable. It illustrates an undoubted case of "duct cancer" in the male breast at the great age of over ninety years. It is noteworthy that the old man had been a shoemaker, and had used the "last" against his mammary region. The affection of the axillary gland was duct carcinoma, while that of the mammary growth was transitional from columnar in the nipple and ducts, to spheroidal in the depths of the gland. It is interesting to observe how the epithelium in the axillary gland copies the original type, and indicates the true nature of the growth.

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[1] *Path. Soc. Trans.* vol. xxvii.

[2] *Path. Soc. Trans.* vol. xxv. pp. 223, 224.

[3] Cripps, *Rectal Carcinoma*, 1st ed. p. 300.

[4] Woolsey. New York Surgical Society, 25th October 1893.

[5] Med.-Chir. Soc. 28th April 1857.

[6] *Path. Soc. Trans.* xxvii. p. 242.

I am indebted to Mr. J. R. Lunn and his assistant, Dr. Townsend, for notes, and the opportunities of studying this case. I may remark that the growth of the nipple has a strong resemblance to an epitheliomatous tumour of that region preserved in the museum of the College of Surgeons (4820 A).

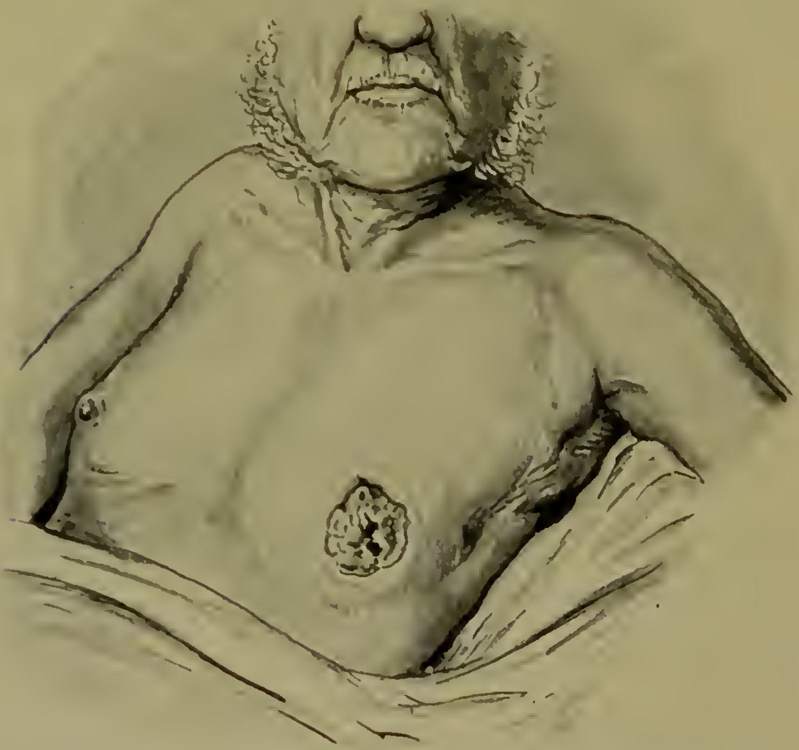

FIG. 58.—Ulcerating carcinoma of the male mamma, with implication of the axillary lymphatics, in an aged man.

The patient for his years was hale and hearty. The nipple became inflamed and tender about eighteen months ago. It "scabbed over," and about five months ago began to swell, and recently to ulcerate. The old man relates a blow upon the part, to which he attributes his troubles. On examination, a reddish, hard, circular, somewhat lobulated growth, bleeding and discharging, occupies the situation of the left nipple. The tumour measures about 1½ inch in radius. Its base is a little constricted, but incorporated with the skin and mamma beneath, which, however, move freely on the pectoral. Some enlarged glands can be felt along the pectoral. The heart and lungs are in good condition, but the liver is somewhat enlarged. The growth was removed by Mr. Lunn, but the patient died of pulmonary œdema. The specimens were shown at a meeting of the Pathological Society, London, on 5th January 1897. The majority of observers believed that the growth was duct carcinoma of the nipple and glands, with transitional change in the breast from columnar-celled to spheroidal carcinoma.

As regards the treatment of carcinoma of the male mamma, there is every reason for early interference. Considering the close relationship of the gland to the pectoral, I should feel inclined to advise the removal of the pectoral fascia in every case, with systematic clearance of the axilla. Many cases are recorded where long periods of freedom from recurrence have occurred after operating upon cancer of this part. Thus there is a specimen of recurrent cancer removed from the pectoral muscle of a man aged sixty-six, which is preserved in the museum of the Royal College of Surgeons (4804 B). More than ten years before, the primary growth had been removed by Bryant. An instance is alluded to by Warren of the extirpation of a cancerous breast from a gentleman aged thirty, who was alive and in health twelve years after. In Hawkins' case, already referred to, the patient lived for nine years, and died without evidence of return of the disease. Several cases in Wagstaffe's tables show favourable results. There is thus every inducement for early and extensive operation in cases of carcinoma of the male mamma, when that rare affection presents itself to our notice. The methods of treatment, of operation, and the questions of dealing with recurrence, are all similar in the male and in the female, and the chapters on those subjects already perused will be sufficient guides. To rewrite here what has been already said would be mere repetition. One caution must be strongly impressed upon surgeons. Cancers of the male breast are often small and insignificant. This is no reason for timid or limited removal. The pectoral fascia is adjacent to the growth, and is very early infected.

In all cases of cancer of the male breast, I would advise removal of the mamma, the pectoral fascia, and all the lymphatic structures from the axilla, as far as is practicable. Should the axillary glands be much affected and the growth fixed, I would advocate removal of the sternal portion of the pectoralis major as well.

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